Production and perception of L2 English orthographic and phonological representations by L1 Tera/Hausa speakers: An experimental study

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Thesis submitted for the award of Doctor of Philosophy

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December 2017

Abstract

Oral English is an integral part of the English language syllabus in Nigeria's secondary schools. However, pronunciation is problematic for students due to factors which include the complexity of grapheme-phoneme correspondences in English, the influence of the students' first language (L1), Tera/Hausa and the method of teaching. Research in second language (L2) acquisition of phonology and on the role of orthographic input has shown that learners' phonological development can be affected as a result of L2 orthographic input (e.g. Young-Scholten 2002; Rafat 2011 & 2016; Bassetti, Escudero and Hayes-Harb 2015; Bassetti and Atkinson 2015; Young-Scholten and Langer 2015). To this effect, the present study is based on the idea that it is possible to address the difficulties that teaching L2 English pronunciation creates for L1 Tera/Hausa (Chadic languages) speakers. This involved providing L2 orthographic input to see whether it influenced learners' underlying representations and in turn their oral production. The research involved an intervention study which was aimed at experimentally examining Tera/Hausa speaking secondary school students' production and perception of English orthography and phonological representations with respect to consonant clusters such as *clock, straw,* and *desk*, digraphs in clusters such as *bench, fridge,* and *syringe,* silent singletons such as *knife, signboard,* and *whistle* and digraph singletons such as *phone, duck,* and *ring*.

The study was conducted with 73 Tera/Hausa speaking secondary school students in Gombe state, Nigeria in pre-testing and post-testing in four sub-tests consisting of two production tasks (picture-naming and reading aloud) and two perception tasks (epenthesis and dictation). A proficiency test was conducted prior to the pre-test which resulted in participants being identified as belonging to three proficiency levels. The learners were randomly (not based on their proficiency) divided into three experimental condition groups and taught eight lessons in 20-minute sessions over four school weeks. Three methods were used for the instruction: *listening + orthography group* where the group were taught while listening to native speaker recordings of the lessons on an audio player while seeing the written forms; *listening-only group,* who were taught by only listening to the recordings of the lessons without any written form; and traditional teaching who were taught by a non-native speaking English teacher using the teaching methods normally used in Nigeria to teach English.

The hypotheses for the study were based on the idea that although Tera and English both use the Roman alphabet they have their own orthographies, grapheme-phoneme correspondences differ and this will affect Tera/Hausa speakers' L2 phonology. As a result, without intervention

at pre-test, it was predicted that the learners will not correctly produce and perceive L2 English consonant clusters, digraphs in clusters, silent singletons and digraph singletons due to problems with the L2 syllable structure. However, with intervention among three experimental condition groups, there will be significant improvement by the group that received explicit phonological and orthographic input than the other groups which did not receive explicit instruction. Qualitative analysis revealed a greater reduction at post-test in error rate by the *listening + orthography* group on all the error categories on the picture-naming task, reading aloud task and dictation task, compared to the *traditional teaching method* group and the *listening-only* group. There was a scattered error reduction rate by the three different proficiency levels. Similarly, in the quantitative analysis, the *listening + orthography* group yielded significantly greater improvement on the dictation task, picture-naming task and reading aloud task ($p \leq 0.05$) compared to the *traditional teaching method* group and the *listening-only* group. Although, the *traditional teaching method* group yielded better improvement on the epenthesis task, the difference between their mean scores with that of the *listening + orthography* group did not differ significantly (0.22 points). Proficiency level, however, did not significantly influence performance on any of the tasks.

The study highlights the effect of orthographic input on Tera/Hausa learners' production perception in the acquisition of English and uniquely serve as the first phonological acquisition study with African data. The findings of this study allow us to make recommendations for the best and most effective ways of teaching oral English in Nigeria and in secondary schools elsewhere.

Dedication

To my late dad, Dr Ali Yunusa

Acknowledgements

I wish to most fondly tender my sincere appreciation to my supervisors Dr S.J. Hannahs and Professor Martha Young-Scholten for their outstanding guidance, encouragement, advice and support through all the stages of this study. They have been such amazing shepherds, guiding me through by their constructive comments and suggestions. I have learnt a great deal about good practice in research through the verbal and written feedback I always received from them. This has not only boost my confidence in doing research but it has reinforced my expectation and helped me in demonstrating performance quality. Also, it has promoted corrective guidance and engagement in discussion. Many thanks indeed.

Doing this study would not have been possible without the unending love and support of my mother and sponsor Mrs Saratu Ali Yunusa who stood by me even when I applied for funding from the Nigerian government but did not get it. You are my superstar mum, and I will forever remain grateful.

Many thanks goes to Professor Anders Holmberg, Dr Cristina Dye, Dr Heike Pichler, Dr Danielle Turton and Dr Geoffrey Poole for their constructive comments, suggestions and advice as my Annual Progress Review (APR) panellist throughout the stages of my study.

I would like to thank my research assistants, Mrs Ruth Atuman and Mr Hassan Mahdi for being such brilliant helpers during the data collection process. My thanks also goes to the participants and staff of Government Junior Secondary Schools in Difa and Zambuk where the field work was conducted for their cooperation and for taking part in the study. Thanks also goes to Professor Benjamin Moda for the support rendered with his vehicle during the data collection. Many thanks goes to Michael Stephenson and David Spittle for helping with the recordings for this study. Thanks to Maha Jasim and Natalia Pavlovskaya for their help with the spot check marking. Thanks to Bashayer Alotaibi for helping me sort out the formatting of this thesis. Many thanks also goes to Dr Simon Kometa of the IT service for the statistical support and advice. Many thanks goes to the school of English Literature, Language and Linguistics for making available to me the postgraduate research support fund which supported the smooth running of this study.

I am grateful to Enas Filimban, Xiangjie Cao, Khansaa Martakush, George Mangse, Olushola Ibiyemi, Alfred & Bukky Bolaji, Christopher Azubuike, Maryam Garba, Dongyan Chen, and Hadi Alsamdani, Abdel Rahman Mitib Altakhaineh and Mufleh Alqahtani for their friendship, moral support and encouragement without which the years doing the PhD would have been

boring. Thanks also to Pastor Sam Chiedozie and all members of RCCG Glory Chapel Newcastle for their encouragement and prayers.

Words are not enough to extend my appreciation to my siblings Maryamu, Damaris, Deborah, Yusuf, Jemima, Yohanna and also Liyatu for their unending love and support through thick and thin. They have been wonderful in looking after my kids together with mum while I was away. Many thanks to my cousin Dr Haruna Moda and his family for their support and always opening their doors for me at Christmas and during other holidays. Thanks to my uncles and aunties who used to call me and encourage me during my studies. Thanks to Mr Nurudeen Abdullahi, Justice Akila Heman, Mr Aminu Usman and Barrister Bala Poloma for their encouragement and financial assistance towards my studies.

I am sincerely grateful to my kids Joshua and Saratu for their love, patience and understanding when I had to be away and not giving them the time and attention they deserved.

Finally, I am grateful to Gombe State University for granting me the opportunity to go ahead and pursue this study.

Above all, I am grateful to God almighty for the gift of life, strength and good health to pursue this course.

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List of Abbreviations

L1 – First Language

L2 – Second Language

NS – Native Speaker

NNS – Non Native Speaker

TL – Target Language

LIST + ORTH – Listening + Orthography

LIST – Listening

TTM – Traditional Teaching Method

H – Hypothesis

RQ – Research Question

N – Number

C – Consonant

V – Vowel

H – High tone

M – Mid tone

L – Low tone

CAH – Contrastive Analysis Hypothesis

MDH – Markedness Differential Hypothesis

CPH – Critical Period Hypothesis

OQPT – Oxford Quick Placement Test

GDSS – Government Day Secondary School

JSS – Junior Secondary School

SSS – Senior Secondary School

LGA – Local Government Area

SUBEB – State Universal Basic Education Board

Cont – Continuant

Son – Sonorant

Sib – Sibilant

Voi – Voice

Pal – Palatal

Cor – Coronal

Nas – Nasal

Syll – Syllabic

Stri – Strident

Chapter 1: Introduction

1.1 English in Nigeria

The importance of the English language in Nigeria cannot be overemphasised because of the numerous functions it performs. English is the second and official language in Nigeria used in government, media, commerce, law, education and in the everyday life of especially the well-educated and the elites. First languages spoken in Nigeria are estimated at over 400 with Yoruba, Igbo and Hausa as the major regional languages (see Chapter Two section 2.1). For its function in education, English serves as the official language of instruction from primary four up through university as prescribed in section four, sub-section 19, items e and f of the Nigerian National Policy on Education of 1977 revised in 1981, 1989 and again in 2004 which states that:

> The medium of instruction in the primary school shall be the language of the environment for the first three years. During this period, English shall be taught as a subject. From the fourth year, English shall progressively be used as a medium of instruction and the language of immediate environment and French shall be taught as subjects. (National Policy on Education, 2004:16).

Up to then, as Okedara and Okedara (1992) note, the British colonial government's literacy policy was operating during the colonial rule in Nigeria. The policy was implemented in 1922 by the Phelps-Stokes commission who had the responsibility of assessing the quality and quantity of education provided for Africans. The commission recommended the use of mother tongue in lower primary schools and the language of the European masters in the upper primary school classes. Clearly, not much had changed from the 1922 Phelps-Stokes commission's policy with that of the 1977 National Policy on Education with regard to the use of indigenous languages in the schools. This is because of the vast number of first languages in Nigeria (see Chapter Two section 2.1) many of which lack orthography or written literature, therefore the need for a unifying medium of instruction.

In addition to the use of English as the medium of instruction in schools, it also functions as a compulsory school subject which students must obtain a credit pass in the Senior Secondary Certificate Examination (SSCE) in order to gain admission into any institution of higher learning. Even though they may pass other subjects, they still require a minimum credit pass in English language for admission into higher learning institutions (Fakaye 2010).

The English school subject and the SSCE are divided into three parts: lexis and structure (grammar), comprehension and summary (reading), and oral English (pronunciation). English

subject is not easy for students, most especially the oral English which requires the students to learn and be examined on both the segmentals and supra-segmentals of English in an objective test. Beyond their exams, students need to communicate effectively in English because of its national and international relevance. These difficulties arise due to various factors which include problems with English phonology comprising firstly, the inaccuracy of English speech sounds which are not reflected by their spelling thereby causing a lot of confusion and disorder for the learners (Upward and Davidson 2012). Secondly, the grapheme-phoneme correspondences of English are not always transparent (Bassetti 2008, Bassetti and Atkinson 2015). Thirdly, errors are due to transfer from the L1 (Major 2008). And fourthly, the inadequacy and ineffectiveness of pronunciation instruction results in problems (Ufomata 1996).

1.2 Aims of the study

Oral English is an integral part of the English language syllabus in Nigeria's secondary schools but is problematic for most students due to the factors listed above, one of which is the relationship between orthography and speech. Research in the L2 acquisition of phonology and orthographic input has shown that learners' phonological development can be affected as a result of L2 orthographic input (see for example Young-Scholten 2002; Hayes-Harb, Nicol and Barker 2010; Rafat 2011 & 2016; Bassetti, Escudero and Hayes-Harb 2015; Bassetti and Atkinson 2015; Young-Scholten and Langer 2015).

Accordingly, the aim of this research is based on the idea that the difficulties that L2 English pronunciation creates for L1 Tera/Hausa[1] learners in Nigeria can be addressed by better teaching. The specific aims are as follows:

1) To experimentally investigate the effect of instruction on phonology of L2 English production and perception by L1 Tera/Hausa learners with regard to consonant clusters, silent singletons, digraph singletons and digraphs in clusters.
2) To bring Tera in to the limelight and to prompt other researchers to investigate other areas of this minority and understudied language.

In the study, the learners' production and perception involving English orthography (written) and phonological (spoken) representations were examined in an experimental intervention. The

[1] Tera speakers are bilinguals who speak Hausa as a lingua franca like the majority of the people in northern Nigeria as we will later see in the cross linguistic description of the languages in Chapter Two. For this reason, the learners will henceforth be referred to as Tera/Hausa learners.

learners were all adolescents recruited among Junior Secondary School year 3 (JSS3) students in Gombe state, Nigeria. They were asked to participate in production and perception tasks during a pre-test. Thereafter, the study itself involved using three methods of teaching oral English to different groups of learners over the course of four weeks of teaching. The different groups formed three experimental condition groups taught using three different conditions. The first condition was exposing the learners to both orthographic and native speaker recorded phonological input. The second condition was exposing the learners to only native speaker recorded phonological input with no orthographic input whatsoever. And the third condition was using the normal teaching method that the learners were used to by a non-native speaker English teacher. The results of the teaching intervention were measured at the end of the study by means of a post-test.

1.3 Contribution of the study

Studies have been conducted on the teaching of English in Nigeria over the years, (e.g. Tiffen 1974, Omodiaogbe 1992, Aduwa-Ogiegbaen and Iyamu 2006, Ufomata 1996, Amuseghan 2007, Yara 2009, Fakaye 2010, Olatunji 2012, Eshiet 2014). None of these studies focused on L1 Tera/Hausa speakers. Also, none of the studies examined the effect of orthographic input in L2 phonological acquisition by Tera/Hausa speakers or any other linguistic group in Nigeria. Additionally and most importantly there is no study in applied linguistics in phonological acquisition which reports on African data. This present study uniquely serve as the first phonological acquisition study with African data. These factors form the motivational basis of this study. Furthermore, as we will later see in the review of previous studies in Chapter Three section 3.3, there is increased interest in the research on L2 phonological acquisition and orthographic input in recent years. Therefore, this study will contribute to the field by firstly, presenting a new phonological acquisition study among Tera/Hausa learners; and secondly, providing evidence for the effect of L2 orthographic input through experimentally investigating L1 Tera/Hausa learners. As for its pedagogical contribution, this study will suggest methodologies for oral English instruction through the findings of the experimental intervention conducted.

1.4 Research questions

As previously mentioned, this study involved an experimental intervention which aimed at examining Tera/Hausa learners' production and perception of L2 English orthographic and

phonological representation. For the effective conduct of this study, research questions were generated consisting of one main research question and specific questions as follows:

Main Research Question

To what extent will Tera/Hausa syllable structures and grapheme-phoneme correspondences influence the L2 English of the learners' production and perception of consonant clusters, digraphs in clusters, silent singletons and digraph singletons?

Specific Research Questions

RQ1. Will explicit instruction affect the performance of Tera/Hausa L2 English learners production and perception involving phonological (spoken) and orthographic (written) tests among three experimental condition groups?

RQ1.1 Can the learners distinguish epenthesised stimulus from the correct ones in a discrimination task?

RQ1.2 To what extent will orthographic input improve learners perception of the correct spelling of words?

RQ1.3 Can the learners improve perception of grapheme-to-phoneme correspondences of words and produce them correctly?

RQ1.4 Can the learners correctly produce the target stimuli when presented with pictures of those stimuli?

RQ1.5 Can the proficiency level of the learners influence their performance on all experimental condition groups?

RQ2. To what extent will Tera L2 learners' errors decrease in production and perception tests after conducting an experimental intervention?

RQ3. Will there be a relationship between production and perception tasks of the learners?

To this effect, 73 Tera/Hausa-speaking secondary school students were recruited in order to experimentally examine these research questions. Production and perception test data were collected from the participants in pre-test and post-test. A proficiency level test was also administered to confirm the proficiency levels of the participants and also find out if proficiency level could influence the performance of the learners after having instruction.

1.5 Overview of the methodology

As stated in the previous section, 73 participants were recruited to experimentally examine the research questions and to collect data that would test the hypotheses of the study. Before collecting the data, a pilot study was conducted in order to test the instruments and materials for the data collection and also to train the research assistants for the study. The data collection involved firstly, administering a proficiency level test to confirm the proficiency levels of the students, then a pre-test in four perception and production tests in epenthesis perception task, dictation elicited written production task, elicited oral production picture-naming task, and reading aloud task. The stimuli for the tasks consisted of 40 tokens of isolated words grouped into nine categories. These tokens were chosen to test the participants' production and perception with regard to consonant clusters, silent singletons, digraph singletons and digraphs in clusters. The participants were then grouped into three experimental condition groups and taught lessons over four school weeks. After the instruction sessions, a post-test was administered to check the effectiveness of the intervention and also the group that improved more and had better reduced error rate on the four tasks. This was checked based on the effect of instruction and proficiency level. The relationship between production and perception was also investigated.

1.6 Structure of the thesis

This thesis consists of seven chapters altogether along with this chapter.

Chapter Two is on the cross linguistic description of the orthography and phonology of Tera, Hausa and English, the languages spoken by the learners. The aim of providing these descriptions is in order to form a baseline and provide information on the L2 English implication for the Tera/Hausa bilingual learners before delving into review of studies on the aspects of L2 English phonological acquisition, orthographic input and instruction.

Then Chapter Three presents the review of previous studies on phonology, orthography, language acquisition and L2 English pronunciation instruction in Nigeria. The chapter begins with review of research on some fundamental theoretical perspectives on interlanguage phonology in L2 acquisition. This is followed by review of studies on key components of this present study, i.e. orthographic input and phonological transfer; then the review of research on the effects of instruction and on relevance of proficiency levels in L2 phonology is provided. Review on L2 segmental production and perception is next followed by the review of studies on the effects of instruction on L2 phonological acquisition. This leads us to the review of L2

pronunciation instruction in Nigeria focusing on the nature of teaching and testing, and the problems surrounding pronunciation instruction in Nigeria's secondary school, then the section on intelligibility. The chapter concludes with the section on the present study having reviewed relevant literature.

The hypotheses and methodology of the study are presented in Chapter Four, where full details and a description of the study are provided. The chapter begins by highlighting the problems learners have with L2 English phonology and then details of the study are provided, beginning with the pilot study. The methodological approach is given, focusing on the selection of the participants and testing procedure. Issues around ethics are provided followed by the details of data collection and the intervention sessions. The chapter concludes with the discussion of how the research assistants were used.

Chapter Five is devoted to the presentation of the qualitative and quantitative analyses results of the four production and perception tasks conducted to provide evidence to test the hypotheses of the study. Firstly, the qualitative analysis results are presented; they give a phonological description of the learners' errors according to six different error categories; i.e. vowel epenthesis, deletion, substitution, metathesis, orthographic influence and loanword transfer. Then the quantitative analysis is presented to show statistical results of learners' performance. This is followed by the production and perception correlation results which leads us to the discussion of the results in relation to the previous literature.

Chapter Six is on the discussion of the results of the study in light of the literature review and also pedagogical implications of the study for L2 pronunciation instruction in Nigeria. Firstly, the chapter begins by revisiting the aims of the study to refresh the reader's mind and then proceeds on the discussion of the findings of the study in relation to the hypotheses of the study and previous studies reviewed.

Finally, Chapter Seven presents the conclusion of the study and recommendations including suggestions for future research.

Chapter 2: Cross linguistic orthographic and phonological characteristics

2.1 Introduction

The focus of this study is on Tera L1 speakers who also speak Hausa as a lingua Franca and English as L2. Therefore, before delving into previous research on L2 English orthographic and phonological issues, this chapter will present the description of the phonological and orthographic characteristics of the these three languages (i.e. Tera, Hausa and English). This baseline will provide information on the implications for the Tera/Hausa bilingual learners of English. Before that, a brief look at the language situation in Nigeria is provided.

The number of languages in Nigeria is estimated at over 400. This is described based on their number of speakers and the role the languages play (see for example, Omodiaogbe 1992, Ufomata 1996, Gordon and Grimes 2005, and Tench 2007b). Due to the diverse number of languages in Nigeria, English is and remains the dominant official and second language used to link the language communities. Hausa, Igbo and Yoruba are considered as the major regional languages (lingua francas) due to the large number of speakers in the northern, eastern and western regions respectively. A few more languages (e.g. Fulani, Kanuri, Efik, Ibibio, Edo, Idoma) are regarded as medium status languages because they have the next largest numbers of speakers as shown in Figure 2.1. The remaining languages (including Tera), are all considered minority languages.

In northern Nigeria, the major language spoken is Hausa. Tera is one of the minority languages spoken by those who also acquire Hausa. English is the official language, learned in school and is the third language for them. Because this study focuses on the production and perception of L2 English phonological and orthographic representation by Tera/Hausa speakers, each section reviews relevant phonology and orthography of Tera, Hausa and English.

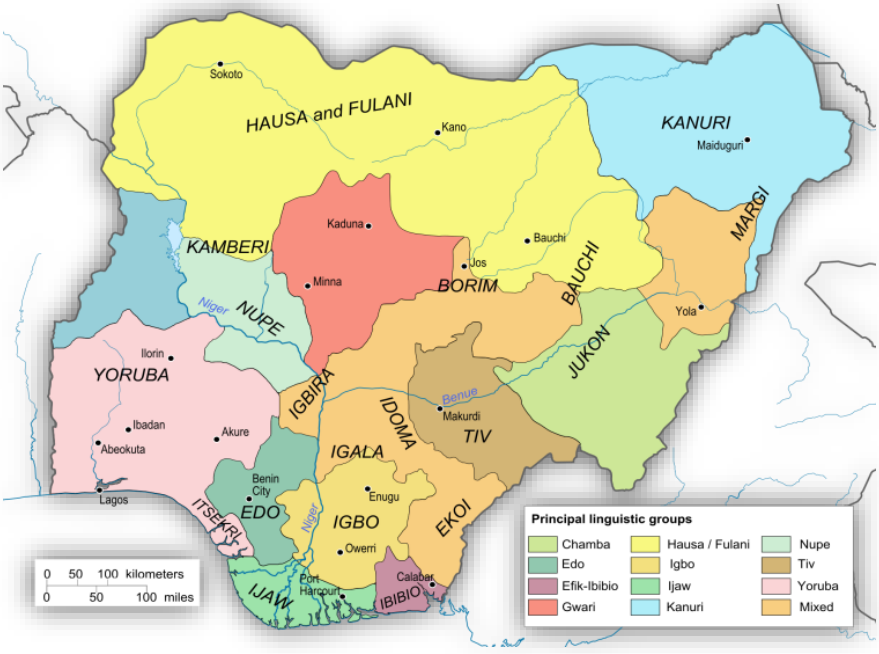


Figure 2.1 Map of Nigeria showing the distribution of the linguistic groups

2.2 Tera phonology and orthography

Tera is the language of the Tera or Nyimatli [ɲimałi] people in Yamaltu Deba Local Government Area (LGA) in Gombe State as shown in Figure 2.2 and, to a lesser extent, in part of Borno State, in north-eastern Nigeria. Tera belongs to the Chadic family branch, precisely the Biu-mandara cluster (Newman 1964, Tench 2007a). According to the report of the National Population Commission (2010) for the 2006 population and housing census, the population in Yamaltu Deba LGA is predominantly occupied by 255,726 people. This figure could reasonably be said to be the population of the Tera speakers plus or minus 20% considering the Fulani herdsmen who dwell in the hamlets of the Tera villages and other Tera speakers in part of Kwami LGA of Gombe state and part of Bayo LGA of Borno state. Note also that the number of Tera speakers could possibly be more considering that there has not been census in Nigeria since 2006. The major occupation of the Tera people is farming, fishing and weaving. Tera is mainly used by the speakers in family and village life and also in radio broadcasting of news locally in Gombe State. Alongside Tera, Hausa is used for wider communication in trade, commerce, media and education together with English (Tench 2007b).

Figure 2.2 Map of Gombe State showing the location where Tera is spoken.

The Tera language is divided into two groups, as identified in Newman (1964), namely the western and the eastern cluster which are divided based on their linguistic correspondence with the present day geographical separation of the area according to two districts namely, Yamaltu district and Deba district. Furthermore, Tera-speaking towns are divided into west, east, north, south and central which correspond to the minor differences in their pronunciation.

The little work on the linguistic description of Tera includes Newman (1964, 1969, 1970); Odden (2005) and Tench (2007 a&b). The descriptions, illustrations and examples used in the present study are based on the most recent linguistic work by Tench (2007a), The Nyimatli (Tera) language project (2015)[2] and the researcher's intuition as a native speaker of Tera from Difa. The variety of Tera used in this study and the researcher's variety is based on the variety spoken in Zambuk and Difa, the standard form of Tera from the central and west central areas respectively.

2.2.1 Tera Phonology

The phonemes of Tera consist of 35 consonant sounds (see Table 2.1), five short vowels /i, e, a, o, u/, their five long counterparts indicated with a colon (:), /ɨ/ which does not have a long

[2] The Nyimatli (Tera) language project is a manual produced by the Nyimatli forum for the development of a writing system that would have a unified spelling system that could be used by both Tera and non-Tera literates. See section 2.2.2 for more explanation on the nature of the project.

counterpart, and four diphthongs /ai, eu, au, oi/. Many of these phonemes are the same as in English or Hausa.

2.2.1.1 Consonants

Table 2.1 Tera consonant chart

	Bilabial	Labio-dental	Alveolar	Post-alveolar	Palatal	Velar	Labial-velar	Glottal
Stop	p b		t d			k ɡ		
Affricate				tʃ dʒ				
Implosive	ɓ		ɗ			ɠ		
Pre-nasalized	ᵐb		ⁿd	ᶮdʒ		ᵑg		
Nasal	m		n	ɲ		ŋ		
Fricative		f v	s z	ʃ ʒ		x ɣ		h
Lateral fricative			ɬ ɮ					
Trill			r					
Lateral Approximant			l					
Approximant					j		w	
Gloattalized approximant				ʔj				

The consonants of Tera shown in Table 2.1 are illustrated in (2.1) with examples, phonetic transcriptions and their English gloss. Tones are indicated on the phonetic transcriptions and not on the orthographic forms. High tone is marked with an acute accent [́], low tone is marked with a grave [̀], and mid tone with no accent (see section 2.2.1.4 for a detailed description of Tera tones).

(2.1) Tera phonemes

Phoneme	**Example**	**Transcription**	**English gloss**
/p/	pagham	/paɣàm/	‘shoe’
/b/	bam	/bàm/	‘free of charge’
/t/	taɗa	/taɗà/	‘heavy’
/d/	daɓti	/daɓtí/	‘mud’
/k/	kooro	/kóːró/	‘donkey’
/ɡ/	goma	/ɡomá/	‘market’
/ʧ/	chit	/ʧɨ̀t/	‘black
/ʤ/	jere	/ʤeré/	‘cap’
/ɓ/	ɓai	/ɓai/	‘fire’
/ɗ/	ɗaa	/ɗaː/	‘run’
/ɠ/	qufa	/ɠɨfa/	‘tree’
/ᵐb/	mba	/ᵐbá/	‘my stomach’
/ⁿd/	ndola	/ⁿdóla/	‘love’

/ᶮdʒ/	njaabi	/ᶮdʒá:bi/	‘kindling’
/ᵑg/	nggubung	/ᵑgɨbíŋ/	‘fool’
/m/	muzhin	/mɨʒín/	‘money’
/n/	num	/nɨm/	‘what’
/ɲ/	nyifi	/ɲífí/	‘life’
/ŋ/	nga	/ŋà/	‘I’
/r/	rap	/ráp/	‘two’
/f/	fan	/fán/	‘here’
/v/	vat	/vàt/	‘four’
/s/	saapa	/sa:pá/	‘dance’
/z/	zan	/zán/	‘north’
/ʃ/	shim	/ʃìm/	‘like’
/ʒ/	zha	/ʒà/	‘break’
/x/	khar	/xar/	‘hand’
/ɣ/	ghos	/ɣós/	‘hair’
/ɬ/	tluna	/ɬína/	‘work’
/ɮ/	dlu	/ɮù/	‘meat’
/l/	laudà	/laudà/	‘finish’
/j/	yurvu	/jùrvù/	‘fish’
/w/	wurti	/wúrtí/	‘bathing’
/ʔj/	dyim	/ʔjím/	‘water’
/h/	hali	/halì/	‘stingy’

Description of Tera consonants

Stops: Initial voiceless stops are moderately aspirated.

Pre-nasalised: Although there is a nasal element in the production of pre-nasalized /ᵐb, ⁿd, ᶮdʒ, ᵑg/ the nasal element is a secondary articulation with the stop element being primary. Pre-nasalised consonants occur only in syllable onset position

Nasals: All four nasal phonemes occur in both onset and coda position.

Fricatives: The glottal fricative /h/ exists mostly in Hausa and English loanwords e.g. <hankal> [háŋkal] *gently* from Hausa <hankali> and <haliluyu> [halilúja] *hallelujah* from English

Affricates: the affricates /tʃ, dʒ/ usually precede front vowels, although, there are rare cases where back vowels occur for example <choro> /tʃòrò/ *anvil*, <ju> /dʒù/ *stand*. This case,

according to Tench (2007a), could be considered a clear '*case of phonemic split*'[3] because the two consonants have established phonemic status.

Implosives: The implosives /ɓ, ɗ, ɠ/, glottalic ingressive stops are produced with glottal vibration like in Hausa. The velar implosive /ɠ/ is voiced which is different to the velar voiceless implosive /ƙ/ in Hausa. While the Tera /ɠ/ is represented orthographically as <q>, the Hausa /ƙ/ on the other hand is represented orthographically as <k>. The tendency for non speakers of Tera whose L1 does not have the voiced velar implosive /ɠ/ is to produce Tera words containing /ɠ/ with either /ƙ/ or /k/ e.g. <qaandi> /ɠa:ⁿdi/ 'greeting'.

Lateral fricatives: The lateral fricatives /ɬ, ɮ/ are other sounds in the Nigerian context that are also unique to Tera like the velar implosive /ɠ/ discussed above. These voiceless and voiced laterals involve friction. Non Tera speakers would tend to use the normal lateral /l/ for both /ɬ, ɮ/ e.g. in <tl<u>u</u>na> /ɬina/ 'work', <dl<u>u</u>m> /ɮɨm/ 'name'.

Glottalized approximant: /ʔj/ is described as a weakening of the palatalised alveolar implosive [ɗʲ] whose alveolar contact has been lost; however the palatalization and glottalalization have been maintained and presented orthographically as <ɗy>.

Complex articulations: There are instances of complex productions whereby some consonants have secondary palatalization /ɓʲ, mʲ, vʲ, kʲ, ɠʲ/ for example compare <ɓakh> /ɓax/ *far* vs <ɓyakh> /ɓʲax/ *to tear* and <va> /va/ *burn* vs <vyang> /vʲàŋ/ *red*, whereas other consonants have secondary labialization /kʷ, ɠʷ, ᵑgʷ, xʷ, ɣʷ/ for example compare <kárí> [kari] *feeding a baby* vs <kwari> /kʷári/ *thinking* and <gari> /gári/ *over ripe* vs gwari /gʷàri/ *growing*.

2.2.1.2 Vowels

Figure 2.3 shows the vowels of Tera. The following pairs of words in (2.2) from Tench (2007a) and The Nyimatli language project (2015) illustrate the contrast between the lengths of the vowels

(2.2) Tera monophthong vowel length contrast

kari	/kári/	'feeding'	vs	kaari	/ka:rí/	'home'
zuri	/zúrí/	'fry'	vs	zuuri	/zu:rí/	'damp'
dliri	/ɮìrì/	'drumming'	vs	dliiri	/ɮi:rí/	'paying'

[3] Lado (1957) describes phonemic split as the restructuring of allophones in the native language as separate phonemes in the target language. This is a historical development in a language, a discussion of which would go beyond the scope of this thesis.

peto	/petó/	‘to pass’	vs	peeto	/pè:tò/	‘a crack on the leg ’
boli	/bolí/	‘lap’	vs	ɓoori	/ɓo:rí/	‘head pad’

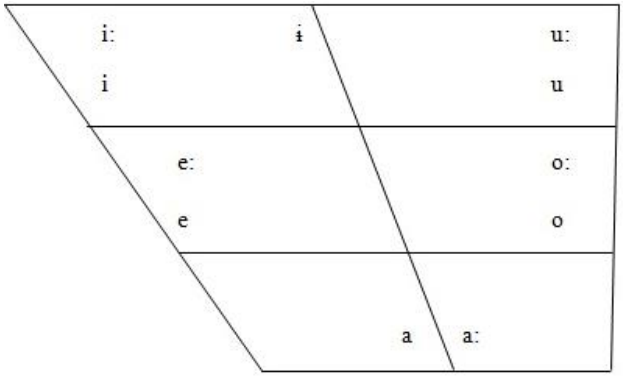


Figure 2.3 Tera vowels

In addition to the monophthongs are the diphthongs which are a combination of two vowel sounds making them have almost the same length as the long vowels. The four diphthongs in Tera are /ai, eu, au, oi/ as in the following examples in (2.3):

(2.3) Tera diphthongs

ghai	/ɣài/	‘town’	ɓai	/ɓái/	‘fire’
ɓeu	/ɓéu/	‘sour’	ghereu	/ɣéréu/	‘scraper’
zharau	/ʒáráu/	‘potash’	kalau	/kálau/	‘dust’
woi	/wói/	‘child’	zhawoi	/ʒàwòi/	‘a kind of plant’

2.2.1.3 Syllable structure

There are three possible syllable structures in Tera which are divided into light (CV) and heavy (CVV and CVC) syllables where the VV in the heavy syllable can be occupied either by a long vowel or a diphthong. See for instance in (2.4):

(2.4) Tera syllable structures

CV	zu̲	/zɨ/	‘said’	tlogha	/ɬo.ɣà/	‘answer’
CVV	ɗau	/ɗău/	‘quick’	gaari	/ga:.rí/	‘farm’
CVC	dlu̲m	/ɮɨ̀m/	‘name’	shakhshakh	/ʃáx.ʃáx/	‘holy’

Tench (2007a) states that occasionally a syllable without an onset can occur, producing a (V) or a (VC) syllable structure. Consider the following in (2.5):

(2.5) Tench's onsetless syllables in Tera

V	i	/í/ 'yes'	ayim	/a.jím/ 'ring'
VV	uughu	/úː.ɣu/ (sense of fear)		
VC	anjinja	/aɲ.dʒiɲ.dà/ 'star'	annya	/aɲ.ɲá/ (sense of uncertainty)

However, this behaviour in Tera could be likened to the one in Hausa (as we will later see in section 2.3.1.3) whereby words may begin with initial vowel in the standard orthography, but phonetically, with a glottal stop. Therefore, the syllable structure of orthographic vowel initial words would be ʔV, ʔVV or ʔVC. This claim could be supported by Itô's (1989) theory of the Onset Principle which states that all languages require syllables with onsets. Thus, the examples above would be represented as the following in (2.6):

(2.6) Tench's onsetless syllables with onsets based on Itô's Onset Principle

CV	i	/ʔí/	ayim	/ʔa.jím/
CVV	ughu	/ʔúː.ɣu/		
CVC	anjinjà	/ʔaɲ.dʒiɲ.dà/	annya	/ʔaɲ.ɲá/

Importantly for the present study, as we shall see, tautosyllabic CC sequences are not permitted in Tera. Sometimes, consonants may follow each other in some words due to the occurrence of certain phonological characteristics which are regarded as complex articulations, for instance, in palatalization for example <vyang> /vʲàŋ/ *red*, <ɓyakh> /ɓʲáx/ *to tear*, and in labialization for example, <kwaaɗa> [kʷaːɗá] *to repair*, <ghwaari> /ɣʷaːrí/ *to dry*, <gwang> /gʷaŋ/ *ten*. Additionally, where there is a medial CC orthographically, they are never in the same syllable, for example <dabti> /dàb.ti/ *mud*, <wankha> /wan.xá/ *lady*. Finally, English loanwords consisting of a CC syllable structure in consonant clusters are resolved by the epenthesis of a vowel. For instance, *bread* /bred/ → burodi /burodi/, *table* /tei.bl/ → tebur /te.bur/, and *brush* /brʌʃ/ → burush /buroʃ/.

2.2.1.4 Tone

One of the ways that meaning is conveyed in many languages of the world is by the change in pitch of the voice either as a register tone (High, Mid, Low, e.g. Hausa, Nupe in Nigeria and Yabem, Bukawa in Guinea) or contour tone (Rising, Level, Falling e.g. Mandarin Chinese and Thai). Tera is a tone language that exhibits register tones whereby words that have the same segments are distinguished by their pitch of the voice. Crystal (2011) describes tone as the essential feature of the meaning of a word which is conveyed by the tone it bears. Most of the time, the meaning of the word is made clearer in context by the tone. In Tera, the syllable is the

tone bearing unit and the tone is marked with an accent on top of the vowel in the phonological transcription but not in the orthography (Tench 2007a). Tera has three contrasting level tones: High (H [́]), Mid (M unmarked) and Low (L [̀]) which can be seen in the following monosyllabic words in (2.7):

(2.7) Tera contrasting tones

H	vii	/víː/	'roast'	zhu	/ʒú/	'in the past'
M	vii	/viː/	'to enter'	-		
L	vii	/vìː/	'iron'	zhu	/ʒù/	'your father'

In addition, combinations of seven tone patterns exist for disyllabic words, although neither a HL nor LH sequence exists. Where there is a neighbouring H or L tone, M tone rises next to H and lowers next to L to produce MH or ML tone. Consider the following tone patterns in (2.8)

(2.8) Tera tone patterns

HH	chelem	/ʧélém/	'giraffe'
HM	kalau	/kálau/	'dust'
MM	roma	/roma/	'rain'
MH	lefun	/lefún/	'cotton'
ML	kuzap	/kɨzàp/	'cloud'
LM	gawu	/gàwu/	'river'
LL	yurvu	/jùrvù/	'fish'

Furthermore, segmental and tonal homophones exist in Tera as well, and it is only the context that can be relied on to convey meaning, see for instance the words in (2.9)

(2.9) Words with the same tone but different meaning in Tera

M	dla	/ɮa/	'cow'	H	ge	/gé/	'hole'
M	dla	/ɮa/	'to climb'	H	ge	/gé/	'to ride'
M	dla	/ɮa/	'to cut'	H	ge	/gé/	'to swim'

Apart from lexical functions, sometimes tones are used to specify the differences in meaning in the grammar of Tera. Consider the following lexical items in (2.10)

(2.10) Tera tones in lexical items/grammatical tones (Nyimatli language project 2015)

a.	H	ngaa na nda	/ŋáː ná ⁿdá/	'I am seeing him'
	M	ngaa na nda	/ŋaː na ⁿda/	'I have seen him'
b.	H	ta pai ɗyim	/tá pái ʔjim/	'you are fetching water'
	M	ta pai ɗyim	/ta pai ʔjim/	'you have fetched water'

2.2.2 Tera Orthography

While most of the minority languages in Nigeria are not used for major activities of modern day affairs, due to advantages majority languages have over them or to limited numbers of speakers, many do not have standardised written forms or at all. Tera, however has a standardised orthography within a limited literature as recorded by the Nyimatli forum in 'The Nyimatli Language Project' (2015) which dates back to the 1930s and the British and Foreign Bible Society under the missionary organization with the publication of *The Gospel of John*, *The Catechism* and *A Song Book*. Since then nothing was written in Tera until the 1990s with the publication of Ayuba Nyagham's *Ye chituku ɓu me Nyimatli* 'The alphabet in Tera language'. In the 2000s, Tera orthography was used in five works which include *Writings of Jauro Maila* (2000) and *Let's Develop Nyimatli Language*, written by Jideonwo (2004), a National Youth Service Corps (NYSC) member then serving in Yamaltu Deba LGA; see The Nyimatli Language Project (2015). Other literatures (not recorded by the forum) include *Labar Khar ɓu Yesu nu Matta nu Luka Bulaki* 'The story of the birth of Jesus written by Matthew and Luke', Madi, Baro and Gaina (2005), *Labarku ɗyirap nu me Nyimatli* 'Twenty stories in Tera language', Gaina (2005), *Lagarkati Shogar Me Nyimatli* 'A book for learning Tera language' Books 1 - 4 Trial Editions, Nyimatli language project (2007), *Labar Mbarkandi nu Luka Bulaki* 'A good story written by Luke' Nyimatli Language and Translation Committee (2008) and *Mewar Alqawarang* 'The New Testament' Nyimatli Language and Translation Committee (2016).

In these writings spanning through the years, the Nyimatli forum observed that there were five different kinds of spellings used; therefore, there was a need for a standard Tera orthography which could unite the Tera people in using one spelling system. The forum in the late 2000s embarked on the Nyimatli (Tera) Language Project with the aim of developing a unified writing system to encourage new literature in Tera, for Tera speakers to be able to read, to encourage its use in schools among the Tera people and to encourage wider use of Tera. The forum followed four basic principles in developing the writing system which include:

1. Accuracy: Based on the thorough examination of the sound system of Tera
2. Consistency: Each sound has a letter which corresponds to that sound only
3. Convenience: Ease of writing and keyboarding
4. Conformity: Use of letters familiar to readers of Hausa and English where possible being the languages that are also written and read by Tera speakers.

In 2008, the forum produced *Reading and Writing Tera (Nyimatli): A proposal for writing the Nyimatli language* trail edition and in 2015 produced the first edition of the book. The forum came up with the new orthography which comprises an alphabet of 30 consonants and 6 vowels as shown in Table 2.2.

Table 2.2 Tera Orthography (O) and phonemes (P)[4]

O	a	b	ɓ	ch	d	ɗ	dl	ɗy	e	f	g	gh	i	j	k
P	/a/	/b/	/ɓ/	/tʃ/	/d/	/ɗ/	/ɮ/	/ʔj /[5]	/e/	/f/	/g/	/ɣ/	/i/	/dʒ/	/k/
O	kh	l	M	n	ng	ny	o	p	q	r	s	sh	t	tl	u
P	/x/	/l/	/m/	/n/	/ŋ/	/ɲ/	/o/	/p/	/ɡ/	/r/	/s/	/ʃ/	/t/	/ɬ/	/u/
O	u	v	W	y	z	zh									
P	/ɨ/	/v/	/w/	/j/	/z/	/ʒ/									

In the case of long vowels, the doubling of the short counterpart occurs in the orthography e.g. <a> lengthens as <aa>, <o> lengthens as <oo> and so on. Also, just like in English (as we will later see), complex graphemes (digraph singletons) represent a single consonant phoneme as shown in (2.11)

(2.11) Tera digraph singletons with their phonemic values

<kh> represents the voiceless velar fricative /x/

<gh> represents the voiced velar fricative /ɣ/

<ng> represents the velar nasal /ŋ/

<ny> represents the post-alveolar nasal /ɲ/

<sh> represents the voiceless post-alveolar fricative /ʃ/

<zh> represents the voiced post-alveolar fricative /ʒ/

<dl> represents the voiced lateral fricative /ɮ/

<tl> represents the voiceless lateral fricative /ɬ/

As mentioned in the introduction of this chapter, Tera speakers are bilingual because they speak Hausa as a lingua franca. We now turn to that language.

2.3 Hausa phonology and orthography

Hausa is spoken in Nigeria, Niger (majority of the speakers) and in Cameroon, Ghana and Togo with about 50 million speakers. It is second to Swahili with widespread use as a lingua franca

[4] The researcher of the present study designed the orthography and phonemes tables for Tera, Hausa and English in accordance with the orthographies available in the literature for the languages.
[5] See the description of Tera consonants on the glottalized approximant /ʔj/ in section 2.2.1.1

in Africa in number of first language speakers among sub-Saharan languages. Like Tera, Hausa belongs to the Chadic branch of the Afro-Asiatic language family (Jaggar 2001, Caron 2011, Abubakre 2008, Newman 2009). In Nigeria, researchers (for example Greenberg 1941, Schuh and Yalwa 1993, Newman 2009, Jaggar 2001, Caron 2011) note that it is one of the major languages alongside Yoruba and Igbo, and used in the north for local communication in commerce, media, government and education also alongside English. It is a first language to millions and a lingua franca to yet more millions. Hausa in Nigeria has three dialects: the eastern, western and northern dialects. The eastern dialect spoken in the city of Kano is the largest and standard Hausa used mostly in publication, education and broadcast of News.

According to Von Gleich and Wolff (1991) and Jaggar (2001), research on Hausa long began in the middle of the 19th century (for example: Barth 1821-1865, Schon 1803-1889, Robinson 1861-1952 and Mishlich 1864-1948). Jaggar points out that Hausa has been researched more widely than any other sub-Saharan language. Hausa has for example two of the best reference dictionaries ever produced for an African language and a number of pedagogical dictionaries. Hausa is a highly influential language on other sub-Saharan languages in Africa and especially in Nigeria where it is mostly spoken. There are a variety of more recent sources on Hausa for example Greenberg (1941); Newman (1973, 1984, 1986 a&b, 2009); Hoffman and Schachter (1969); Newman and Jaggar (1989); Schuh and Yalwa (1993); Jaggar (2001) and Caron (2011). These studies examine Hausa phonology, syntax, and morphology. For the purpose of this study, this section draws synchronically and diachronically mainly on Schuh and Yalwa (1993), Jaggar (2001) Newman (2009) and Caron (2011) to look at phonology.

2.3.1 Hausa Phonology

Standard Hausa has 32 consonants as shown in Table 2.3 and these are described in Table 2.3.

Fricatives*:* The voiceless bilabial fricative /ɸ/ is pronounced by most speakers of the standard dialect as /ɸ, p, f,/ and /h/ by other dialects. With the significant number of English loanwords in Hausa, loanwords that begin with the phoneme /p/ are usually pronounced as /f/ because Hausa has no phoneme /p/. For instance, *paint* becomes <fenti>, *pump* becomes <famfo>. English words with alveolar fricatives /θ, ð/ are usually produced with alveolar fricatives /s, z/ and the alveolar stop /t, d/ to a lesser degree[6], e.g. *other* becomes <oza> or <oda>, *thin* becomes <sin> or <tin>. This also results in confusion between minimal pairs in English words such as

[6] See Tiffen (1974)

fill vs *pill* and *fat* vs *pat*[7]. Also, although the voiced post alveolar fricative /ʒ/ do not occur in Hausa, but speakers tend to be able to produce it in English words by adding voicing to the voiceless one which is present in Hausa.

2.3.1.1 Consonants

Table 2.3 Hausa consonants (Schuh and Yalwa 1993)

	Bilabial	Alveolar	Post-alveolar	Palatal	Palatalized velar	Velar	Labialized velar	Glottal
Plosive & affricate	b	t d	ʧ ʤ		kʲ gʲ	k g	kʷ gʷ	ʔ
Implosive & ejective	ɓ	tsʼ ɗ	(ʧʼ)	ʔʲ	ƙʲ	ƙ	ƙʷ	
Nasal	m	n						
Fricative	ɸ	s z	ʃ					h
Tap/Trill		r ɽ						
Approximant	w			j				
Lateral approximant		l						

Stops*:* Voiceless initial stops /t, k/ are moderately aspirated. Because the voiced labiodental fricative /v/ is not a member of the Hausa phonemic system , it is usually replaced with a voiced bilabial stop /b/ in English words such that for example *very* becomes <bery> and *vice* becomes <bice>, also, resulting in confusion between minimal pairs in English words such as *ban* vs *van* and *bent* vs *vent*

Implosives*:* The implosives /ɓ, ɗ/ are produced with glottal vibration. The implosion may however vary depending on speaker and probably the speech rate.

Nasals*:* the two contrastive nasals /m, n/ in Hausa appear as velar nasal /ŋ/ in word final position or word medially before a velar, glottal or labio-velar approximant /w/ e.g. <kaɗan> /kaɗaŋ/ *a little*, <sanƙo> /saŋƙo/ *baldness*, <kanwa> /kaŋwa/ *potash*, and <mutum> /mutuŋ/ *person*. In some cases, /n/ is pronounced as /ɲ/ in words like <hanya> /haɲa/ *road*. Though the syllable boundary falls between n and y in the orthgraphy, the nasal assimilates with the following consosnant and result in the alternation to /ɲ/.

Affricates*:* Generally, affricates are moderately aspirated. In the standard dialect spoken in Kano, the voiced post-alveolar affricate is pronounced /ʤʰ/ as in /ʤʰaki/ <jaki> *donkey*. However, in the western dialect especially the one spoken in Sokoto it is pronounced /ʒ/ /ʒaki/.

[7] See Hoffman and Schachter (1969)

Ejective affricates: The ejective alveolar affricate /ts'/ as in /ts'ami/ <tsami> *sour* tend to be realised as the affricate in the standard dialect whereas some other dialects realise it as a post-alveolar ejective affricate /ʧ'/, /ʧ'ami/ .

Glides*:* the glides /w/ and /j/ occur in syllable onset position except where they form the first element of a geminate in medial position e.g. in <bi-yay-ya> /bi.ja.ja/ *obedience*, <daw-wa-ma> /dau.wa.ma/ *make permanent*.

Glottalization*:* In the standard pronunciation, the glottal stop /ʔ/ begin words written in intial vowels. For instance the word spelt <ado> *decoration* will be pronounced /ʔado/ same as <ido> *eye* will be pronounced as /ʔido/.

2.3.1.2 Vowels

The Hausa vowel system consists of 12 vowel sounds which are made up of five basic vowels /i, e, a, o, u/ which produces a further five more vowels as a result of lengthening; in addition are also two diphthongs /ai, au/. As shown in Figure 2.4 based on Schuh and Yalwa (1993)

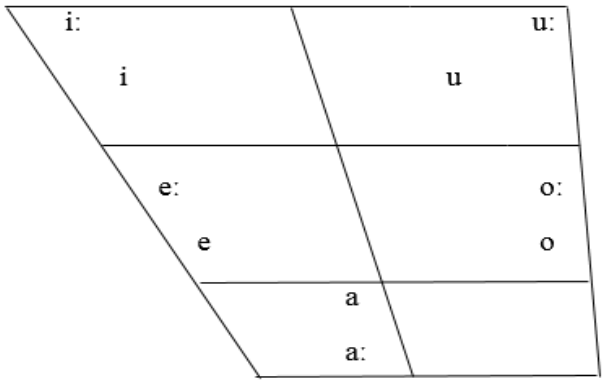


Figure 2.4 Hausa vowels

Short vowel realization varies depending on the surrounding consonantal and vocalic environment. For instance, short /u/ is realised as /i/ or /ɪ/ before a glide /j/ e.g. <wuya> /wiya:/ *neck*.

The distinction between long and short vowels is preserved only in open syllables and these bear a heavy lexical and syntactic load. For instance, vowel length is lexically contrasted in word medial position e.g. <dafa> /da:fà:/ *lean on* vs <dafa> /dafà:/ *cook*.

2.3.1.3 Syllable structure

Jaggar (2001), Newman (2009) and Caron (2011) identify three permissible syllable structures which are described according to their weight viz: light CV and heavy CVV and CVC as shown in the following words in (2.12)

(2.12) Hausa syllables

CV	ma.ce	/**ma**.ʧe/	'woman'
CVC	has.ke	/**has**.ke/	'light'
CVV	ɓau.na	/**ɓau**.na/	'buffalo'

Although in Hausa, words may begin with initial vowels in the standard orthography, these words actually begin with a glottal stop /ʔ/ phonetically in keeping with *V_, thus making the syllable structures of the following othographic vowel intial words [ʔV], [ʔVV] or [ʔVC] as the case may be as shown in (2.13).

(2.13) Vowel initial words in Hausa

CV	i.do	/**ʔi**.do/	'eye'
CVV	au.na	/**ʔau**.na/	'measure'
CVC	is.ka	/**ʔis**.ka/	'wind'

In addition, consonant clusters (CC) are not permitted in Hausa. Although consonants may occur next to each other in word medial positions, this happens across syllable boundaries and the consonants usually share the same feature for voicing. For instance <caz-bi> /ʧaz.bi/ *rosary* where /z/ and /b/ are [+voice], <caf-ke> /ʧaf.ke/ *snatch* where /f/ and /k/ are [-voice]. Furthermore, there are instances where consonants may follow each other in the orthography, however, the orthography reflects either secondary articulation which include palatalization e.g. <kya-ma> [kʲa:.ma] *aversion*, labialization e.g. <gwan-da> [gʷaŋ.da] *papaya*, or gemination e.g. <dab-ba> [dab.ba] *animal*.

Hausa has many loanwords from English (and also Arabic, see for instance Abubakre 2008, and Alqahtani & Musa 2015) and wherever there is a consonant cluster in the borrowed word, it is avoided by inserting an epenthetic vowel in onset clusters as shown in (2.14)

(2.14) Onset cluster vowel epenthesis in English loanwords

'scout' → /si.ka:.wut/

'professor' → /fu.ro.fe.sa/

'screw' → /su.ku.ru/

Also, by adding a post-thetic vowel to coda cluster as shown in (2.15)

(2.15) Post-thetic vowel epenthesis of coda clusters in English loan words

‘bench’ → /beŋ.ʧi:/

‘advance’ (money) → /ʔa.di.bas/

‘allowance’ → /ʔa.la.wus/

Note that in *advance* the velar fricative /v/ is replaced with the voiced bilabial plosive /b/. Recall in the description of consonants above, it was mentioned that because the voiced velar fricative does not occur in Hausa phonemic system. As a result, Hausa speakers substitute it with a voiced bilibial stop in e.g. *very* → <bery>. There is also deletion of the alveolar nasal [n] e.g. in *advance* and *allowance* to avoid a CC segment in coda position. As for bench, the nasal is not deleted but made the coda of the penultimate syllable to avoid a CC segment.

Furthermore, some English loanwords ending with an obstruent add an epenthetic short [i] after the obstruent as shown in (2.16)

(2.16) Vowel epenthesis in English loanwords ending with obstruents

‘bread’ → /bu.ro.di/

‘plank’ → /fi.laŋ.ki/

‘bank’ → /baŋ.ki/

2.3.1.4 Tone

There are three level tones in Hausa and the syllable is the tone bearing unit. Jaggar (2001), Newman (2009) and Caron (2011) describe these tones as a high (H) tone left unmarked and low tone marked with a grave accent (̀) on the vowel of the syllable which bears the tone. The third register tone is a contour falling (F) tone indicated with a circumflex (̂) on the vowel of the tone bearing syllable. The (F) tone appears only with heavy CVV and CVC syllables. Like in Tera, these tones are not indicated in the orthography. Consider the following tone combinations in (2.17)

(2.17) Hausa tone combinations

Disyllabic		Trisyllabic	
HL	yaro /ya:.rò:/ ‘boy’	HHL	fartanya /far.tan.yà:/ ‘hoe’
LH	riga /rì:.ga:/ ‘gown’	LHH	ƙoƙari /ƙò:.ƙa.ri:/ ‘effort’
HH	kifi /ki:.fi:/ ‘fish’	HLH	magani /ma:.gà.ni:/ ‘medicine’
LL	daga /dà.gà/ ‘from’	LHL	mamaki /mà:.ma:.kì:/ ‘surprise’

Tone in Hausa has both lexical and grammatical functions. For some words, meaning is derived through the tone pattern of the words as shown in (2.18)

(2.18) Tone indicating grammatical differences in words

H	kai /kai/ 2.SG.M.IDP pronoun	vs	F	kai /kâi/ ‘head’
HL	wuya /wu.jà/ ‘neck’	vs	LH	wuya /wù.ja/ ‘difficulty’
HL	kuka /ku:.kà:/ ‘boabab’	vs	HH	kuka /ku:.ka:/ ‘crying’

2.3.2 Hausa Orthography

The need for Hausa to develop more than for its demand for the former colonial powers grew after World War II. Missionary activities and the British colonial policy of indirect rule in the northern region of Nigeria presented the need for a standardized form of Hausa for the purpose of wider communication. According to Von Gleich and Wolff (1991) and Newman (2009), two writing systems were available in Hausa. The first system called Ajami [ʔàʤàmí] has existed for some centuries; an adapted version of the Arabic script, as at that time, most of the early Hausa literature was Islamic poetry or religious. Due to the conflict between the colonial powers and the traditional powers, the colonial masters associated the Ajami writing system with Islamic leadership and therefore adopted their alphabet known as Boko /bo:ko:/ (from English ‘book’). In 1911 - 1912, Vischer introduced “rules for Hausa Spelling” in the campaign againts illiteracy (*Yaki da Jahilci* ‘war against ignorance/illiteracy’). In the 1930s more development in the Hausa literature was recorded with the establishment of a translation bureau which was later renamed the ‘literature bureau’. The first newspaper title *Gaskiya ta fi kwabo* (‘truth is worth more than a penny’) was published in 1939 and is still waxing strong today. That phase of development in the Hausa writing system moved to another phase with the establishment of the Hausa Language Board in 1955, whose goal was to unify the spelling of Hausa words and loanwords from other languages as well.

Today, Boko is the main alphabet for Hausa speakers, although there are still instances where the Ajami system is used by Muslim teacher-scholars and their students in Koranic schools, by poets for composing the verses of their poetry and by some who do not have any form of western education, Jaggar (2001).

There are basically two systems of writing Boko (Von Gleich and Wolff ibid); the first is the official standard orthography which includes the ‘Gaskiya system’ as actually used in Nigeria, the ‘Bamako system’ as used in Niger between 1966 and 1980 and the ‘Niamey system’ as

agreed upon in 1980 for both Nigeria and Niger. The second is the 'scientific transcription system' as used by linguists. The main difference between the two is in the placement of tonality and representation of vowel length. The official standard system does not indicate tone and vowel length unlike the scientific transcription. This present study however uses the Gaskiya system as used in Nigeria. The Hausa alphabet is presented in Table 2.4

Table 2.4 Hausa orthography (O) and phonemes (P)

O	a	b	ɓ	c	d	ɗ	e	f	g	h
P	/a/	/b/	/ɓ/	/ʧ/	/d/	/ɗ/	/e/	/ɸ/	/g/	/h/
O	i	j	k	ƙ	l	m	n	o	r	s
P	/i/	/dʒ/	/k/	/ƙ/	/l/	/m/	/n/	/o/	/r/, /ɽ/	/s/
O	sh	t	ts	u	w	y	'y	z	'	
P	/ʃ/	/t/	/ts'/	/u/	/w/	/j/	/ʔʲ/	/z/	/ʔ/	

Boko has several additional letters to represent Hausa phonemes including an apostrophe (') to represent the glottal stop /ʔ/, the alveolar ejective /ts'/, or the glottalized palatal <'y> /ʔʲ/. This does not occur with vowel initial words, it only occurs word medially in the orthorgraphy for example, <ɗan'uwa> /ɗanʔuwa/ *brother*, <sa'a> /saʔa/ *luck*. In addition, there are two digraph singletons in Hausa as shown in (2.19)

(2.19) Hausa digraph singletons with their phonemic values

<sh> representing the voiceless post-alveolar fricative /ʃ/

<ts> representing the voiceless alveolar ejective /ts'/

Turning next to the description of English phonology and orthography, recall that it was mentioned in the introduction of this chapter that alongside Tera which is the learners' L1, they also speak Hausa as a lingua franca and English as L2 (or L3). Now we turn to the description of the relevant phonology and orthography of English in section 2.4.

2.4 English phonology and orthography

As stated in Chapter One section 1.1, English language plays a very important role as an official language in Nigeria due to the diverse languages. It is the second and official language which serves as the language used by the government, the medium of educational instruction also a compulsory school subject, language of the media and commerce, and language used for social interactions especially by the educated elites.

2.4.1 English phonology

The typical phonemes of RP English consist of 25 consonants and 21 vowels. Received Pronunciation (RP) is the accent that is often referred to as the 'prestige' accent in British society which is also associated with the speech of English public schools' graduates. It is the accent that foreign learners of British English are often taught (including Nigeria), and has hence been described widely (Carr 2013). The phonology aspect in this section is described based on Jones (1956), Dunstan (1969), Roach (2009), Davenport and Hannahs (2010), Ladefoged and Johnson (2011), Rogerson-Revel (2011) and Carr (2013).

2.4.1.1 Consonants

Table 2.5: English consonant chart

		Bilabial	Labio-dental	Dental	Alveolar	Palatal	Post alveolar	Velar	Glottal
Stops		p b			t d			k g	ʔ
Affricates							tʃ dʒ		
Fricatives			f v	θ ð	s z		ʃ ʒ		h
Nasals		m			n			ŋ	
Approximants	Liquids				l ɹ				
	Glides	w				j			

Stops: The voiceless stops /p, t, k/ in word initial positions are produced with an audible outrush of air that immediately follows with their release called aspiration. This is indicated by a superscript [^{h}] just next to the voiceless stops, e.g. [p^{h}, t^{h}, k^{h}] as in *pie* /p^{h}aɪ/, *tie* /t^{h}aɪ/ and *key* /k^{h}iː/. The voiced stops /b, d, g/ on the other hand are unaspirated. For many speakers of English, the /t/ sound in middle position is pronounced with the glottal stop /ʔ/ e.g. in *butter* /bʌʔə/. In word final positions, stops are often produced with no audible release and it is indicated by a diacritic symbol [$^{\urcorner}$] following the segments. For instance, in the final [d$^{\urcorner}$] of *bad* /bæd$^{\urcorner}$/.

Fricatives: The fricatives /f, v, θ, ð, s, z, ʃ/ occur word-initially, word-medially and word-finally. The voiced post-alveolar fricative /ʒ/ never occurs in initial position in native vocabulary and the glottal fricative /h/ occurs only word-initially. Voiced fricatives undergo partial devoicing in word initial and final positions, but between other voiced sounds, they are fully voiced. For instance, compare the /v/ in ***v****an* /væn/, *ca****v****e* /keɪv/, and *o****v****er* /əʊvə/; the initial and final /v/ in '*over*' is voiced all through its production whereas in '*van*' and '*cave*' it is partially devoiced. Also, voiceless fricatives are longer in duration than their voiced counterparts. Consider the following minimal pairs: *face* vs *faze* /feɪs, feɪz/ and *safe* vs *save* /seɪf, seɪv/.

Affricates: The only two affricates of English /ʧ/ and /ʤ/ are post-alveolar and occur word-initially, word-medially and word-finally. Where there is a preceding sonorant (nasal, liquid or glide), the voiced affricate /ʤ/ is lengthened for instance in *lu**n**ch* vs *lu**n**ge* where the affricates follow a sonorant /n/.

Nasals: The bilabial and alveolar nasals /m/ and /n/ can occur word-initially, word-medially and word-finally, but the velar nasal /ŋ/ can only occur word medially and word finally, no English word begins with the velar nasal. English nasals can be syllabic i.e. they can form the nucleus of a syllable when they occur at the end of a word. This is indicated with a diacritic [̩] below the nasal e.g. in *button* /bʌtn̩/. Also, assimilation occurs with the alveolar nasal /n/ such that it agrees to the place of articulation of the segment following it. For instance if the alveolar nasal /n/ is next to a bilabial segment e.g. [b], it produces a corresponding bilabial nasal [m] instead of [n]. So, *in Britain* will be produced as [ɪm brɪtn̩].

Approximants: All the approximants are voiced. As seen in the chart in Table 2.5, English approximants are divided into liquids (lateral /l/ and rhotic /ɹ/) and glides /w/ and /j/. They are described separately as follows:

Laterals*:* The lateral /l/ occurs word initially, word-medially and word-finally. There is a noticeable difference between the lateral /l/ in word initial position and word final position. Two types of articulation occur for the lateral, there is the non-velarised or clear 'l' which occurs word initially and word-medially before a vowel e.g. in *leaf* /liːf/ and *yellow* /jeləʊ/. The other one is the velarised or dark 'l' indicated with the symbol [ɬ] and occurs word-finally e.g. *pull* /pʊɬ/, syllabically e.g. *little* /lɪtɬ̩/ and before a consonant e.g. *child* /ʧaɪɬd/.

Rhotics: English has a wide variety of rhotics including /r, ɾ, ɹ, ɻ, ʀ, ʁ/, but only the alveolar continuant /ɹ/ which is commonly heard in RP will be focused on here. RP like all other varieties of English has pre-vocalic 'r' as in the words ***r**oom* or *spa**rr**ow*. However, not all varieties have rhotic word-finally like in fear /fɪə(ɹ)/ and part /pɑː(ɹ)t/. The varieties of English that have this form of rhotic word-final productions are called *rhotic accents* whereas those that do not have it (e.g. RP) are referred to as *non-rhotic acce*nts. Although there are instances that word final 'r' is pronounced even in non-rhotic varieties, but that occurs when a final 'r' precedes a vowel in the orthography, this is called *linking 'r'* for instance in *far away*.

Glides: The two English glides /w/ and /j/ are also called semi-vowels phonetically. The labio-velar /w/ is similar to the back vowel /u/ whereas the palatal /j/ is similar to the front vowel /i/. The labio-velar glide /w/ occurs in word initial positon and in a cluster following the consonants

/t, d, k, s, θ/ e.g. in *twine* /twaɪn/, *dwell* /dwel/, *queen* /kwiːn/, *sweep* /swiːp/, *thwack* /θwæk/ and also following the sequence /sk/ as in *squad* /skwɒd/. On the other hand, the palatal glide /j/ occurs word-initially preceding a vowel as in *yam* /jæm/, *you* /juː/, or in initial clusters before the vowels /uː/ as in *hue* /hjuː/ and /ʊə/ as in *cure* /kjʊə/.

2.4.1.2 Vowels

There are 21 vowels in RP English: 13 monophthongs comprising eight lax (short) vowels /ɪ, ɛ, æ, ə, ʌ, ɒ, ɔ, ʊ/ five tense (long) vowels /iː, ɜː, ɑː, ɔː, uː/. In order to show length, a colon (:) is usually used for tense vowels. Consider the difference in the following pairs of words in (2.20)

(2.20) RP English tense and lax vowel distinction

‘sit’	/sɪt/	vs	‘seat’ /siːt/
‘pat’	/pæt/	vs	‘part’ /pɑːt/
‘pot’	/pɒt/	vs	‘port’ /pɔːt/
‘them’	/ðəm/	vs	‘term’ /tɜːm/
‘pull’	/pʊɬ/	vs	‘pool’ /puːɬ/

The monophthongs are described based on height, frontness, roundness and tenseness as represented in the vowel space in Figure 2.5.

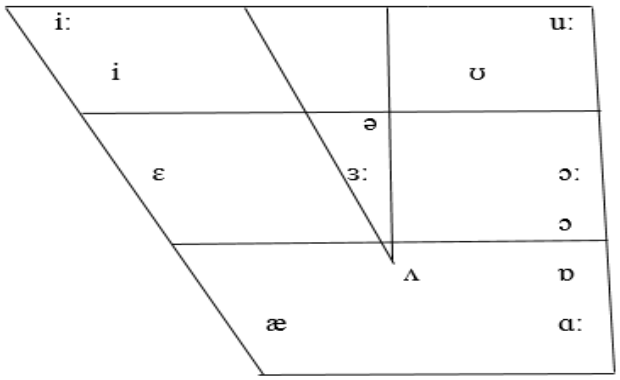


Figure 2.5: RP English monophthongs

The diphthongs of English are shown in (2.21)

(2.21) English diphthongs

/eɪ/	as in	‘gate’	/ɡeɪt/	/aɪ/	as in	‘try’	/traɪ/
/ɔɪ/	as in	‘spoil’	/spɔɪl/	/aʊ/	as in	‘house’	/haʊs/
/əʊ/	as in	‘go’	/ɡəʊ/	/ɪə/	as in	‘pier’	/pɪə/
/ɛə/	as in	‘fare’	/fɛə/	/ʊə/	as in	‘poor’	/pʊə/

2.4.1.3 Syllable structure

English has a more complex syllable structure than Tera and Hausa. There are a large number of possible syllable structures in English and they are made up of both light and heavy syllables. These are illustrated in (2.22) as described in Rogerson-Revell (2011) and Dunstan (1969)

(2.22) Some possible syllable structures in English monosyllable words

V	'eye'	/aɪ/
VC	'up'	/ʌp/
CV	'two'	/tuː/
CVC	'cup'	/kʌp/
CCV	'pray'	/pɹeɪ/
CCCV	'straw'	/stɹɔː/
CVCC	'desk'	/desk/
CVCCC	'sixth'	/sɪksθ/
CVCCCC	'texts'	/teksts/
CCCVCC	'sprint'	/spɹɪnt

All consonants can occur in syllable initial position except the velar nasal /ŋ/. Also, except for the phonemes /h/, /r/, /ʒ/, /j/, and /w/, all consonants can occur in syllable final position in RP English. Phonotactics restrict adjacent phonemes Rogerson-Revell (2011). English can have up to three consonants in onset position and also in coda position which are not necessarily the same sequence with those that can occur in onset position. For instance, the onset sequence /spr/ cannot occur in coda position, we can have ***spr****ing* in the onset but not **ti****spr*** in the coda. In addition, in coda clusters, only the phonemes /m/, /n/, /ŋ/, /s/ and /l/ can occur in pre-final position, whereas only /s/, /z/, /t/, /d/, and /θ/ can occur in post-final (1) position. In some cases there could be a post-final (2) position whereby a plural ending in either /s/ or /z/ is added, or the addition of a past tense ending in either /t/ or /d/. If the final consonant in coda clusters is voiceless /s/ or /t/, the preceding consonant will be a voiceless sound or /n/ or /l/ in the case of /s/ and /m/, /n/, or /l/ in the case of /t/. On the other hand, if the final consonant in coda clusters is voiced /z/ or /d/ then the preceding consonant will be voiced. Consider the rule in (2.23) and the examples in (2.24)

(2.23) C → [α voice] / C _____ #

$$\begin{bmatrix} \alpha \text{ voice} \\ - \text{ son} \end{bmatrix}$$

(2.24) Voicing in coda clusters

a) final /s/ in 'cups' [kʌps]
b) final /t/ in 'dreamt' [dɹemt]
c) final /z/ in 'boys' [bɔɪz][8]
d) final /d/ in 'sobbed' [sɒbd]

Based on the explanation above, the rule in (2.23) shows that a consonant becomes α voice (i.e. either voiced or voiceless) after a consonant that is either voiceless in (2.24) example (a), voiced in example (c) and (d), or - sonorant in example (b).

As earlier mentioned in the description of English consonants, it is possible for nasals to function as the nucleus of a syllable, and liquids can also perform the same function as syllabic consonants. A diacritic [̩] is used below the syllabic consonant to indicate syllabification. For instance in, *cotton* /kɒ.tn̩/ and *bottle* /bɒ.tl̩/.

2.4.2 English orthography

English grapheme-phoneme correspondences are complex because although there are 26 Roman alphabet letters, there are more than 26 phonemes represented. While some have just one phonemic value, others have more than one phonemic value as shown in Table 2.6. These correspondences are due to additional factors. These could be seen as occurring due to historical factors and other phonological processes. Carr (2013) describes these realizations as firstly, due to manner assimilation, for instance the phoneme /n/ undergoes the process of nasal assimilation as a result of the place of articulation of the following consonant e.g. in *ink* /iŋk/ whereby the phoneme /n/ assimilated to the value of the following velar consonant and is then realized as the velar nasal /ŋ/. Likewise, if it is a bilabial consonant that is following the nasal phoneme /n/ then it will be realised as a bilabial nasal e.g. in *input* /impʊt/. Thus, in this case, the nasals /n, m, ŋ/ could be said to be allophones of a single phoneme /n/.

[8] Note that all vowels are voiced that is why the plural <s> in boys is pronounced as /z/ because of the vowel /ɔɪ/.

Table 2.6 English orthography (O) and phonemes (P)

O	a	b	c	d	e	f	g	h
P	/æ, aː, ə/	/b/	/s, k/	/d/	/iː*[9], e, ɛ/	/f/	/ɡ, ʤ/	/-[10], h/
O	i	j	k	l	m	n	o	p
P	/ɪ, ia/	/ʤ/	/k/	/l/	/m/	/n, m, ŋ/	/ɒ, ɔː, ʊ,* uː*/	/p/
O	q	r	s	t	u	v	w	x[11]
P	/kj/	/ɹ/	/s, z, ʃ, ʒ/	/t/	/ʊ, uː, ʌ/	/v/	/-, w/	/z/
O	y	z						
P	/j/	/z/						

English has a number of digraph and trigraph singletons (words that contain two and three graphemes respectively) with one or more phonemic values. The reason for these are not far from the historic reasons of the English spelling (see Upward and Davidson 2011, Rudling 2012, Crystal 2012 and Carr 2013) also discussed in section 2.5. The following are the digraphs and trigraphs of English with their phonemic correspondences in (2.25)

(2.25) English digraph and trigraph singletons with their phonemic values

<ck> represents /k/ in du**ck**

<ph> represents /f/ in **ph**one

<sh> represents /ʃ/ in **sh**oe

<gh> represents /g/, /f/ and Ø[12] in **gh**ost, rou**gh**, hi**gh**

<rh> represents /ɹ/ in **rh**apsody

<ng> represents /ŋ/ in ri**ng**

<th> represents /θ/, /ð/ in **th**in, **th**at

<dg> represents /ʤ/ in ba**dge**[13]

<dj> represents /ʤ/ in a**dj**ust

<ch> represents /ʧ/, /ʃ/, /k/ in **ch**ief, **ch**ef, **ch**aos

[9] An asterisk (*) on a particular phoneme denotes that the grapheme can be doubled in words for instance in steel [stiːl], cool [kuːl], foot [fʊt]

[10] A dash (-) denotes that the orthographic letter is silent in words for instance in honest [ɒnɪst], write [ɹaɪt]

[11] Apart from the phoneme /z/, the grapheme <x> has other correspondences with double phonemic value, these include /ks/ in six [sɪks], /gz/ in exact [ɪgzækt], /kʃ/ in luxury [lʌkʃəɹɪ] and /gʒ/ in luxurious [lʌgʒʊəriəs]

[12] The symbol Ø is used to represent a null value.

[13] See section 2.5.2 example 2.27 item (c) on the rule for –ge sequence.

<sc> represents /s/, /ʃ/, /sk/[14] in **sc**ience, con**sc**ience, **sc**old

<gu> represents /g/, /gw/ in **gu**ard, an**gu**ish

<ge> represents /ʤ/ in oran**ge**

<qu> represents /k/, /kw/ in uni**qu**e, **qu**iz

<tch> represents /ʧ/ in fetch

<sch> represents /sk/[15], /ʃ/ in **sch**olar, **sch**nauzer

2.5 English spelling and pronunciation

Following up the review of the description of English phonology and orthography in section 2.4, this section provides a review of some studies on English spelling and pronunciation. In doing so, a review of studies on the English spelling system is first discussed looking at how English spelling has evolved over time. Subsequent sections look at aspects of English sound-symbol correspondences.

2.5.1 The English spelling system

The English spelling system cannot be adequately dealt with without looking at a brief history of the evolution of the English spelling system. The studies reviewed in this section gave insights into the development of present day English spelling. Specifically expounding on the reasons why the English spelling system is notoriously irregular and complex. The variety in words and spelling of English is based on the fact that English comes from five languages grouped into two; the Germanic languages (German, Dutch, and Scandinavian) and Romance languages (French and Latin). Research (e.g. Upward and Davidson 2011, Rudling 2012 and Crystal 2012) has shown the developmental trend of present day English spelling spanning from the 1st century during the time of the Roman, Anglo-Saxon, Viking and Norman invaders that settled in England. The reviews in this section are based on these studies. Before the Roman invasion and colonization of Britain in 43AD, Celtic-speaking tribes were the inhabitants of most of modern day Britain. During the Roman rule, Celtic was spoken although Latin was the administrative medium of communication and also used by the literate Britons and by their Roman rulers. Latin words in use in present day include for instance: *scissors, island, plumber,*

[14] Carr 2013 describes /sk/ as a phonemic value for the diagraph <sc>. Considering that the grapheme <c> has phoneme /k/ as a corresponding phonemic value as shown in Table 2.6, the /sk/ sequence could be regarded as a consonant cluster and not a digraph.

[15] Same explanation applies here as in 13. The digraph <ch> has a corresponding phonemic value /k/ in ‘chaos’ as such /sk/ in ‘scholar’ will be considered a cluster

debt (all containing silent letters) *bona fide, camouflage, legion, sewage* etc. When the Romans eventually withdrew from Britain in 410 AD in order to defend Rome, Britain was once again invaded by other northern Europe tribes i.e. the Saxons, Jutes and Angles. The '**gh**' digraph words have Anglo-Saxon origin for instance *night* from *niht*, *daughter* from *dohtor*, *rough* from *ruh*, *bough* from *bōh*. Other words include for instance, *white* from *hwit*, *whale* from *hwael*, *while* from *hwil*, *woman* from *wifman*.

In 793AD in the 8th century, the Vikings (Old Norse) from Scandinavia invaded Britain. They fought the Anglo-Saxons and finally settled together in peace. About 2000 new words were brought in by the Vikings for example *die, smile, egg, anger, awkward, silver*; and the present day silent letters <k> and <g> which the Vikings then used to pronounce today are kept in the spelling, e.g. *knife, knee, knot, gnaw, gnat, gnome*. Many words beginning with <sk> and <sc> also have Viking origin, for instance, *skill, sky, skin,* and *scale, scare, score*.

In 1066, the Normans (French speakers) invaded Britain and defeated them in the Battle of Hastings. They settled in Britain over three centuries and French and Latin became the language of government and law. The Normans were the lords and barons and English ceased being a written language as it was the language of the peasants and lower class. A lot of French words were brought into English and spelt in French for example, *servant, traitor, romance, crown, parliament, castle, army, quality, and question*. Many Old English spellings were replaced by the French scribes whose jobs were copying and writing of books, laws etc. for instance, <**gh**> replaced <**h**> in '*liht*' spelt *light*, <**ch**> replaced <**c**> in '*cild*' spelt *child*, <**ce**> replaced <**s**> in '*mys*' spelt *mice*, <**ou**> replaced <**u**> in '*hus*' and spelt *house* <**qu**> replaced <**cw**> in '*cwene*' spelt *queen*. For <c>, the Normans had a rule for <c> pronounced [s] before <i, e, or y> as in *decide, cement, cyber*; and [k] before <a, o, u>; before a consonant or at the end of a word for example, in *cap, come, cup, clean, public*. Furthermore, other French origin words have a silent 'h' e.g. *honest, hour, honour,* and *heir*.

From 1066 - 1485 Middle English coexisted with Latin, French and English. Latin and French influence on English can be seen in the origin of the various words with similar meanings in (2.26)

(2.26) Latin, French and Anglo-Saxon choice of words

Latin	**French**	**Anglo-Saxon**
consecrated	sacred	holy
conflagration	flame	fire
interrogate	question	ask
opulence	riches	wealth
secure	firm	fast

Crusades to the Middle East and the holy land that took place in the 12th and 13th centuries resulted in new borrowed words from Arabic for instance, *racket* from *rahat*, *sugar* from *sukkar*, *magazine* from *makhazin*, *mattress* from *matrah*.

In the period between 1450 and 1750 the *Great Vowel Shift* occurred when dictionaries began to be published. It was a period that experienced a general raising of the long vowels, except vowels /i/ and /u/ which were not raised for the fear of them becoming consonants; therefore, they were made diphthongs /ei, ou/ and later changed to /ai, au/. This same period was when the first printing press was established by Johannes Gutenberg. While the technology of printing press grew, it fostered the development of literacy. There was disappearance of many consonants and vowels, and although the spellings of a lot of words were retained, many letters that had been pronounced became silent. For instance, <w> in *wrist, write, wreck* became silent; <k> and <g> in *gnat, gnash, know, knife* became silent.

By the 18th, 19th 20th and 21st centuries, the British Empire had expanded and hundreds of words were brought into English from languages in all parts of the world. For instance: *pecan* (Native American), *veranda* (India), *ketchup* (Chinese), *kiwi* (Maori), *safari* (Swahili), *boomerang* (Australian aborigines). In addition, thousands of words were bought into English as a result of the 20th century technological advancement which mostly had Greek and Latin origin e.g. *computer*, *telephone, microchip, television*; and other words coming in due to computer.

2.5.2 Sound-symbol correspondences

The ability to produce English words accurately is not a guarantee that one would be able to spell them correctly. This is due to the complexity of English spelling as discussed above (Upward and Davidson 2011). Compounding this situations are in accents and dialects across the English speaking world e.g. London, Scotland, Newcastle, east Midlands, America, Australia, Canada and their varieties (Rudling 2012). Moreover, the way words are pronounced has changed over time as discussed above. For the L2 learner, the complexity of the grapheme-

phoneme correspondences of English results in a double challenge to the learning of reading and phonology on the other hand. Studies (e.g. Hayes-Herb, Nicol and Baker 2010, Bassetti 2008, Bassetti and Atkinson 2015) have shown that English spelling-sound correspondence can be systematic; but, it is not transparent in the sense that the written forms of some English words show their pronunciation more directly than other words. Seidenberg, Waters and Barnes (1984) note that while some English words are easier to read and pronounce and are regarded as *regular words*; others are arbitrary, unpredictable and irregular and are therefore considered *exception words*. Upward and Davidson (2011) concur and this is reflected in their presentation on the inconsistency and complexity of the relationship between English spoken language and written form, noting the thoughts of some linguist and researchers who have criticised the English spelling thus:

> The Danish linguist Otto Jespersen, for example, refers to English spelling as a 'pseudo-historical and anti-educational abomination'; an American linguist, Mario Pei, has described it as 'the world's most awesome mess' and 'the soul and essence of anarchy'; Mont Follick, a former professor of English who as a British Member of Parliament twice, in 1949 and again in 1952, introduced bills into Parliament advocating the simplification of English spelling, said of our present-day spelling that it is 'a chaotic concoction of oddities without order or cohesion'; and more recently the Austrian linguist Mario Wandruszka pronounced it to be 'an insult to human intelligence'. Only slightly gentler in its reproach is Professor Ernest Weekley's opinion that the spelling of English is, in its relationship to the spoken language, 'quite crazy'… (Upward and Davidson 2011:1).

It is not surprising that L2 learners of English experience difficulty with the non-transparent English spelling and in turn with pronunciation. Although English spelling and pronunciation is complex, there are fundamental regularities (Carr 2013). English grapheme-phoneme correspondence rules constitute a large set of rules that is beyond the scope of this thesis.[16]In the remaining part of this section, we will look at some examples of spelling and pronunciation rules in (2.27) given to show the relationship between graphemes and phonemes as illustrated by Derwing, Priestly and Rochet (1987), Carney (1994), Rudling (2012) and Vainikka (2013)[17].

(2.27) English spelling and pronunciation rules

a) <c> → /s/ / ___ <i, e, y> - **ci**te, **ce**ll, **cy**cle

[16] See Carney (1994) and Vainikka (2013) for a detailed illustration of English letter-to-sound correspondence rules

[17] Note here that other monographs are not given here because they have the same grapheme and phonemic value for instance <b> → /b/, <d> → /d/, <k> → /k/, <m> → /m/ and so on.

b) <c> → /k/ / elsewhere - a**c**t, **c**an, **cl**imb

c) <g> → /ʤ/[18] / ___ <i, e, y> - **gi**ant, a**ge**, phonolo**gy**

d) <x> → /z/ / **# ___** - **x**ylophone, **x**erox, **x**enophobia

e) <x> → /ks/ / elsewhere - si**x**, fi**x**, o**x**ide

f) <k> → Ø / ___ n - **k**nee, **k**nife, **k**night

g) <g> → Ø / ___ n - **g**nash, **g**naw, **g**nat

h) <p> → Ø / ___ n - **p**neumonia, **p**neumatic

i) <w> → Ø / ___ r - **w**rite, **w**rist, **w**rap

j) <p> → Ø / ___ s - **p**sychology, **p**sychic, **p**salm

k) <l> → Ø / ___ k, f, m, v - wa**l**k, ta**l**k, ca**l**f, ha**l**f, ba**l**m, pa**l**m, ha**l**ves,

l) **<b>** → Ø / ___t, - de**b**t, dou**b**t,

m) <n> → Ø / m ___ - hym**n**, colum**n**, autum**n**

n) <b> → Ø / m ___ - com**b**, thum**b**, num**b**

L2 learners of English need to learn the fundamental regularities of English spelling and pronunciation. The rules in (2.27) items (a) to (e) give simple and clear guidance governing the pronunciation of the monographs. On the other hand, items (f) to (n) are rules governing silent letters, (recall that Ø denotes null value whereby although the grapheme is in the spelling, but it has no phonemic value and as such not pronounced). Other spelling and pronunciation difficulties are with diagraphs and trigraphs as shown in example (2.25)

In her view on language writing systems transparency, Bassetti (2008, 2012) states that the correspondence of the grapheme-phoneme in an ideal alphabetic writing system should have the same phonemes spelled with the same grapheme and the same grapheme should be pronounced with the same phoneme. These assertions suggest that the spelling-sound correspondences of the English language demonstrate that English show much less correspondence regularity in the written and spoken forms as seen above than other transparent language forms. For example, in the string of the bold letters in the following words: *en**ough*** [ʌf] *thr**ough*** [uː] *th**ough**t* [ɔː] and also in ***ch**air* [ʧ] ***ch**ef* [ʃ] ***ch**emist* [k]; the irregularity in the

[18] Derwing *et al*. (1987) identified some exceptions where <g> → [g] even when it is followed by <i, e, y>. These are grouped into three

- Immediately after another **g** for instance in *beggar, bigger, baggy*
- In words that involve **ng** before the process of normalization of suffix –er as in *sing-er, hang-er;* or the adjective suffix -y as in *tang-y, string-y*.
- In some words with Germanic origin such as *girl, get, give*

orthography and phonological representations between the letters in bold and each preceding sound can clearly be heard. Other instances are found, for example, in English silent singletons where a sound has a graphemic value but no phonological value (Bassetti and Atkinson 2015). Also, in consonant clusters where two or more consonant phonemes occupy one unit following a sequence making a syllable structure which can occupy the onset or the coda. For instance, two consonants e.g. /st/ as onset (CCV) in *stop* /**st**ɒp/ and as coda (VCC) in *post* /pəʊ**st/**; three consonants in onset (CCCV) structures e.g. *splash* /**spl**æʃ/, *spring* /**spr**ɪŋ/ and *strong* /**str**ɒŋ/ and in coda (VCCC) e.g. *sixth* /sɪ**ksθ/**, *fixed* /fɪ**kst/**, *boxed* /bɒ**kst/** (see section 2.4.1.3 for English syllable structures). Additionally, in digraph/trigraph singletons where two/three letters have a single phonemic value. Examples of digraph combinations include consonant + consonant e.g. p + h *ph* /f/ in *phone* /fəʊn/, s + h *sh* /ʃ/ in *ship* /ʃɪp/; or consonant + vowel for instance g + e *ge* /ʤ/ in *syringe* /sɪrɪnʤ/. Also with geminates, which is the doubling of consonants which originated from old English spelling to represent long consonants but which in Modern English no longer do, for instance <ff> in *buffalo* /bʌ.fə.ləʊ/, <bb> in *hubby* /hʌ.bi/, <mm> in *mammal* /mæ.ml/, <tt> in *button* /bʌ.tn/ an so on (Carr 2013; Venezky 1970 & 1999; Yule 2006). These therefore suggest that learners and users alike should not be carried away by the English spelling system but they should be aware of the phonological processes involved in learning to read. Importantly, learners and users need to pay close attention regarding phonological awareness, which is the explicit awareness of the various phonological segments such as phonemes, syllables and so on that are more or less characterised by an alphabetic awareness, this in turn contributes to their phonological developmental skills (Blachman 2000).

2.6 Comparison of Tera, Hausa and English

The previous sections provided description of the orthographic and phonological characteristics of the three languages used by the participants of this study namely: Tera, Hausa and English. This was done in order to give a cross linguistic background of various aspects of phonology and grapheme-phoneme correspondences. In this section a comparison of the phonology and grapheme-phoneme correspondences is provided.

2.6.1 Phonology

A comparison between English vs Tera phonemes shows that except for the English dental fricatives /θ/ and /ð/ and the approximant liquid /ɹ/, all the other English phonemes exist in Tera. As for English vs Hausa, all the other English phonemes exist in Hausa with the exception of the following English phonemes /f, v, θ, ð, ʃ, ʒ, ŋ ɹ/. Implosive phonemes e.g. /ɓ and ɗ/ exists

in Tera and Hausa but not in English. Also, although English has more vowels, all Tera and Hausa vowels also exist in English except for the high central vowel /ɨ/ which occurs only in Tera. A difference was seen in the syllable structures of Tera and Hausa which both have three syllable structure CV, CVV and CVC, whereas English has more syllable structures due to its complex onsets and codas. As discussed, complex onsets and codas are not permitted in both Tera and Hausa therefore, the speakers resolve English loanwords containing 'notorious' complex CC or CCC syllable structures by the epenthesis of a vowel both in onset and coda positions e.g. *plank* → /fi.laŋ.ki/, *screw* → /su.ku.ru/. In addition, speakers of a language are able to control their speech by the level of pitch and there are two types of pitch control that exist in human language, tone and intonation (O'Grady, Dobrovolsky and Katamba 1996). Recall from the discussion of the tonology of Tera and Hausa in sections 2.2.1.4 and 2.3.1.4 respectively that variation in the pitch of the voice is used to distinguish one word from another called lexical tone. Crystal (2011:486) defines lexical tone as "the essential feature of the meaning of a word which is given to it by the tone that it carries" (either High, Mid, or Low for register tonal languages e.g. Tera and Hausa; and Rising, Level or Falling for contour tonal languages e.g. Mandarin and Thai). While Tera and Hausa use pitch variation at the word level, English on the other hand also uses pitch variation but at phrase and sentence level called intonation. Carr (2013:107) defines intonation as 'the use of pitch contour over stretches of speech which often consists of more than one word'. In English, intonation is very important in conveying meaning. Rogerson-Revell (2011) outlines the main functions of intonation as

- Attitudinal function: deals with the facilitation of the expression of attitudes and emotions.
- Accentual function: deals with helping the speaker to accentuate bits of information and also de-emphasize others.
- Grammatical function: enables the listener to recognize the grammatical structure of the spoken language.
- Discourse function: shows the relationship of one piece of speech action to another, the 'new' and 'old' pieces of information, and signalling speakers' turns in a conversation from the beginning and ending.

2.6.2 Grapheme-phoneme correspondences

Turning to the orthography, Tera, Hausa and English all use the Roman alphabet. English has more grapheme-phoneme correspondences compared to both Tera and Hausa and has a number of digraph and trigraph singletons representing single phonemes as shown in example (2.25). Tera has eight digraph singletons where each digraph represents just one phoneme as shown in (2.11), whereas Hausa has only two digraph singletons as shown in (2.19). The only common digraph between the three languages is <sh> representing /ʃ/. Only English and Tera have the digraph <ng> representing /ŋ/. Bearing this in mind, it is predicted that Tera and Hausa speakers will treat English diagraphs and trigraphs that are not present in their L1 as they would treat non-permissible CC or CCC syllable structures as discussed above.

As shown in section 2.5 on English spelling and pronunciation, due to the changes that English spelling went through over time, some English graphemes are silent, i.e. they do not have any phonemic value and as such, though they are present in the orthography, they are not pronounced. Tera and Hausa on the other hand do not have silent letters. All the graphemes in both languages have phonemic values, it is predicted that Tera and Hausa speakers will produce English silent letters.

The cross-linguistic descriptions of Tera, Hausa and English provided in this chapter have provided us with baseline information of L2 English implication for the Tera/Hausa bilingual speakers. These phonological and orthographic descriptions including the review of the aspects of the English spelling and pronunciation have set the context for the literature review on L2 phonology, L2 orthographic influence, and pronunciation teaching provided in the next chapter.

Chapter 3: Review of previous research on phonology, orthography, language acquisition and pronunciation teaching

3.1 Introduction

In the previous chapter, the phonological and orthographic characteristics of Tera, Hausa and English were discussed. A comparison of the phonology and grapheme-phoneme correspondences of the three languages enables us to make predictions for the Tera/Hausa bilingual speakers. In this chapter, reviews of previous studies on phonology, orthography, language acquisition and pronunciation teaching are presented. The structure of the chapter consist of reviews of prominent research on some fundamental theoretical perspectives on interlanguage phonology in the field of L2 phonology provided in section 3.2. These theories revolve around transfer from the L1, markedness relation between L1 and L2 and the effect of age. Reviews of previous research in two key components of this study i.e. orthographic input and phonological transfer are provided in section 3.3. This is followed by the review of previous research on relevance of proficiency level in L2 phonological acquisition studies in section 3.4. Furthermore, because this study looks at production and perception of L2 English, a review of studies that examined L2 segmental production and perception is provided in section 3.5. The reviews of studies on the effects of instruction is provided in section 3.6. This is followed by a review of L2 English pronunciation teaching in Nigeria in section 3.7 and on intelligibility in section 3.8. The chapter ends by providing a brief on the present study in section 3.9.

3.2 The acquisition of L2 phonology

Troike (2006:4) defines second language as "typically an official or societally dominant language needed for education, employment, and other basic purposes. It is often acquired by minority group members or immigrants who speak another language natively." In acquiring a second language, learners are acquiring different domains of the linguistics of the language e.g. syntax, morphology and phonology. When speaking of second language phonology, it is the acquisition of the segmental and supra-segmental characteristics of a language. The segmental characteristics deal with consonants and vowels, while supra-segmental phonology deals with other phenomena which affect more than one segment e.g. syllable structure and stress (Archibald 1998; Altmann and Kabak 2010). The phonological aspects of second language acquisition has long been of interest. Issues revolve around transfer from the L1, markedness relations between the L1 and L2 and the effect of age. A review of three prominent theoretical

perspectives on interlanguage phonology, i.e. Lado's Contrastive Analysis Hypothesis (CAH), Eckman's Markedness Differential Hypothesis (MDH), and Lenneberg's Critical Period Hypothesis (CPH) are provided in this section.

3.2.1 Contrastive Analysis Hypothesis (CAH)

The Contrastive Analysis Hypothesis (CAH) proposed by Lado (1957) has been associated with language teaching and claims that all errors that a language learner makes can be explained by L1 transfer and predicted on the basis of the relationship of the native and target language features (Major 2008). Since 1957 researchers have been working with the CAH on studies of the contrast between languages by learners (e.g. Stockwell and Bowen 1965; Wardhaugh 1970; Ulijn 1977; Zobl 1982; Anderson 1987; Bialystock 1994; Fisiak 1991; Jaszczolt 2011; Richards 2015).

The predictions of the CAH were quickly criticized on the basis that many learners do not make the predicted errors. Wardhaugh (1970) introduced a strong version versus a weak version of the CAH in order to tackle this shortcoming. He states that the strong version, which was the original intention of the CAH, predicts errors that a language learner makes and it requires the linguist to have a "complete linguistic description of the two languages being contrasted so as to produce the correct set of contrast between the two languages" (1970:125). On the other hand, the weak version analyses learner errors in a second language learning situation and requires the linguist to "use the best linguistic knowledge available to him in order to account for observed difficulties in second language learning" (1970:126). Selinker (1972) pointed out that the second language acquisition system is subject to many factors, and transfer is only one of them. Wardhaugh adds that the weak version leads to making fewer demands of contrastive hypothesis more than the strong version. He further criticizes the strong version and states that it is only workable for "one who is prepared to be quite naive in linguistic matters", but praised the weaker version stating that "it has proved to be helpful and undoubtedly will continue to be so as linguistic theory develops" (1972:129).

The notion of CAH was however critically assessed by researchers, one of whom was Eckman (1977) who proposed another phonological hypothesis which relates to the relations due to markedness between the L1 and L2 and is referred to as the Markedness Differential Hypothesis.

3.2.2 Markedness Differential Hypothesis (MDH)

Eckman (1977, 1985) argues for a concept of "relative degree of difficulty" to be embodied in the CAH and states that it needs to provide deeper comparison of the native and target languages. Moreover, this concept must be independent of any given language and must be valid to any second language acquisition. Eckman then proposed a Markedness Differential Hypothesis (MDH) of which the concept of "degree of difficulty" corresponds to the concept of "typologically marked".

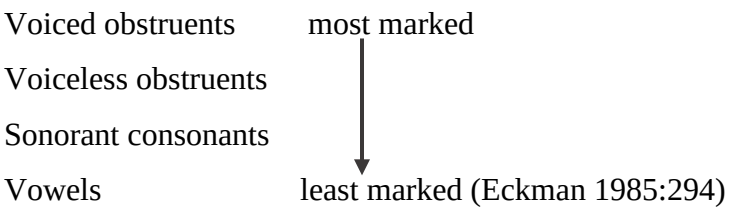
The MDH suggests that the areas of difficulty that a language learner will have can be predicted on the basis of a systematic comparison of the grammars of the native language, the target language and markedness relations, such that:

a) Those areas of the target language which differ from the native language and more marked than the native language will be difficult.

b) The relative degree of difficulty of the areas of the target language which are more marked than the native language will correspond to the relative degree of markedness.

c) Those areas of the target language which are different from the native language, but are not more marked than the native language will not be difficult (Eckman 1985:291).

Eckman further argues that the MDH is capable of providing explanation of certain errors and lack of errors in second language acquisition that could not be explained by the CAH. The MDH assumptions about second language acquisition are basically twofold. Firstly, the learners have already gained certain knowledge about language by having acquired their L1. That the degree of difficulty that is then involved in acquiring aspects of the target language that are different to the native language are predictable. Consider for instance the universal hierarchy that depicts the relative degree of markedness of segments in word-final position which consist of the following:



From the above hierarchy, the prediction of the MDH is that voiced obstruents are the most difficult segments to acquire whereas vowels are the least difficult. Using the example of the Japanese and the Polish speaking learners of English, Eckman states that because in Japanese,

only vowels and sonorant consonants are allowed to occupy word-final position, therefore the Japanese learner must first learn the production of voiced and voiceless obstruents. For Polish on the other hand, because only voiceless obstruents, sonorants and vowels are allowed in word-final position, Polish learners of English must learn to produce English voiced word-final obstruents.

Secondly, the assumption that interlanguage structures are shaped by the same general principles that also shape primary languages. The claim of the MDH here is that interlanguages will be distributed in like manner as the primary languages with regards to any set of structures to which a markedness relation can be applied. Accordingly, since the assumption is that relatively more marked structures are difficult to acquire than less marked ones, then L2 learners' interlanguage structures will always be contained by more marked structures if only their interlanguage contains less marked as well. For instance, based on the prediction of the MDH, an L1 Japanese learner of L2 English will acquire word-final voiceless obstruents before acquiring word-final voiced obstruents. This is because only vowels and sonorants are allowed in final position in Japanese. The assumption here is that the learner's interlanguage will contain word-final voiced obstruents only if it contains word-final voiceless ones as well, (Eckman 1985).

Despite the weaknesses of the CAH demonstrated by the MDH, it did not hinder research on transfer from still being a fundamental area of much work at the segmental to prosodic levels. (e.g. on segmental, Zampini 2008; on syllable structure Eckman & Iverson 1994; on metrical structure Archibald 1993; even research from an OT (Optimality Theory) framework recognize the significance of transfer, which in OT terms can be characterised as L1 constraint rankings (e.g. Broselow, Chen, & Wang 1998; Lombardi 2000; Hancin-Bhatt 2000).

3.2.3 Critical Period Hypothesis (CPH)

This is another well-considered issue of the effect of age and the ability to acquire native-like pronunciation. The Critical Period Hypothesis (CPH) first hypothesized by Lenneberg (1967) states that the biological changes that occur in people's brains makes it difficult for the learner to perceive and produce native-like sounds beyond a certain age. Therefore, the language could be acquired only within a certain period, extending from early infancy until puberty. Lenneberg's hypothesis was however concerned primarily with first language acquisition, and the question whether the CPH is related to second language acquisition was still not clear. This hypothesis was further supported by Johnson and Newport (1989) in a study of the acquisition

of English grammatical structures among native speakers of Korean and Chinese from different age groups in the United States to check the existence of the effect of the critical period in language acquisition. If there was any effect, then it should be the case that young Korean and Chinese learners were better in English language acquisition than the adults, and they should therefore attain higher proficiency levels. They noted that the test performance was linearly connected to the age of arrival up to puberty after which performance dropped but highly variable and had no relationship with the age of arrival. Based on their studies of different groups of learners that they tested, the authors made a generalization about the kind of relationship. They noted that the learners who arrived before the age of seven attained native performance while those who arrived after that age had a linear decline in performance up to puberty. Also, learners who arrived after the age of puberty on the average performed more poorly than the learners that arrived earlier. However, after puberty, there was no decline in performance with increasing age. Johnson and Newport sum it up and state that:

> The pattern of this relationship supports a maturational account of the age effects found. It does this by the fact that the age effect is present during a time of ongoing biological and cognitive maturation and absent after maturation is complete (i.e. at puberty). Thus it appears as if language learning ability slowly declines as the human matures and plateaus at a low level after puberty. The precise level of this plateau differs between individuals (Johnson and Newport 1989:90).

Additionally, on their opinion about the gradual decline of performance, Johnson and Newport state that it seems Lenneberg's original purpose for proposing the critical period hypothesis in language acquisition is to predict the relationship that exists between age of acquisition and language performance. Precisely, the prediction that the period between infancy to puberty is perhaps the "normal" language learning period, whereas late exposure to language after puberty will result in a loss of abilities in language acquisition. However, the result in Johnson and Newport's study on second language acquisition does not show a similar pattern. They reported that no evidence was found in the study that showed a relationship between age of acquisition and performance throughout childhood in second language acquisition which had a sudden decline in performance indicating the end of the critical period. On the contrary, they noted that learners' performance gradually declined from about age seven until adulthood. Although this linear decline is not consistent with Lenneberg's implied function, it is consistent with results from other behavioral fields in which critical periods have been hypothesized (e.g. Oyama 1978; Patkowski 1980; Newport 1984), Johnson and Newton (ibid).

As discussed in this section, the claim of the CPH is that due to loss of normal plasticity, the acquisition of language after the close of the critical period i.e. after puberty is less native-like. Research (e.g. Scovel 1969, 1988; Bongaerts 1999, Birdsong 1999) has shown that among the different domains of linguistics for example syntax, morphology, semantics, and discourse; phonological acquisition appears to have the lowest Critical Period. The reasons for this as Scovel (1988) notes is that pronunciation is the only aspect of language which has a 'neuromuscular base', which requires 'neuromotor involvement' and also has a 'physical reality'. This means that in relation to acquisition of other linguistic domains, phonological acquisition is subject to the effect of age more than the other domains. For the reason stated above, it is expected that the phonological development of the participants in this present study who are adolescent students in JSS3, aged 12-16 and fall in the period of late puberty i.e. almost exiting the critical period, would be influenced.

In sum, the theoretical perspectives on interlanguage phonology discussed in this section may seem to be separate hypotheses, they relate in one way or the other in second language acquisition studies. In the following section, phonological aspects of second language acquisition will be discussed.

3.3 Orthographic input and phonological transfer in L2 acquisition

In this section, reviews of previous research on studies of orthographic input and phonological transfer in L2 acquisition are provided with evidence from various studies that show their effect in L2 acquisition.

3.3.1 Transfer of orthography: Orthographic input

Research in L2 acquisition of phonology and the role of orthography in phonological acquisition has in recent years been an area of growing interest. Studies in this area have provided evidence about L2 learners' segmental and supra-segmental phonological development due to the effect of orthographic input; and inferences about the phonological forms of new words and the effects of L2 orthographic representations on pronunciation by L2 learners of English. In addition they look at the effects of orthography on phonological transfer that leads to non-targetlike productions, due to the effects of grapheme-phoneme correspondences. As well, pronunciation of known words by experienced L2 learners and the effect of orthographic exposure leading to epenthesis to resolve complex clusters has been examined (e.g. Bassetti 2008; Young-Scholten 2002; Young-Scholten and Langer 2015; Rafat

2011 & 2016; Hayes-Harb, Nicol and Barker 2010; Bassetti, Escudero and Hayes-Harb 2015; Bassetti and Atkinson 2015; Young-Scholten, Akita and Cross1999). In this section, this evidence is reviewed.

The first study we will be looking at is Bassetti (2008) which provides an overview of the issue being looked at. She noted two main differences of the effect of orthographic representation in both native speakers and L2 learners. Firstly, for native speakers only the phonological awareness task is affected by the orthography whereas for L2 learners, the pronunciation is also affected. This is probably because L2 learners are being exposed to orthographic input prior to their mastery of the target phonology. Bassetti adds that orthographic input provides a visual and permanent analysis of the auditory input which may compliment a defective perception, thus enabling learners to produce phonemes they have difficulty perceiving. Of course this does not totally rule out the possibility of native speakers also producing spelling pronunciation. Secondly, while only orthography internal factors affect native speakers, L2 learners are affected by the interaction between the orthographies of both their L1 and the L2. Furthermore, Bassetti points out that orthographic input can have both positive and negative effects on L2 pronunciation; see also Rafat (2011). Whereas the positive effects could be that the orthographic representation of an L2 can help learners to acquire target phonemes, syllables and words, the negative effects could be in non-targetlike pronunciation including phone additions, omissions and substitutions. She sheds light on spelling pronunciations where learners realize non-permissible sequences in their L1 but are present in the L2 orthography and correspond to silent letters. For instance the production of the phoneme /b/ in words like *climb* and *debt* where /b/ is silent.

Evidence for the effect of orthographic input is provided in Young-Scholten's (2002) study which looked at exposure to the written form of an L2 and its effect on phonological development. The aim of the study was to check whether the amount of exposure to the orthographic input influenced the acquisition of German final devoicing for L1 English speakers (German devoices obstruents in word-final position e.g. <bund> /bʊnd/ → [bʊnt]). Considering that although learners may have been exposed to much orthographic input from the early stages of learning mostly around the age of six, however, not much is known about the influence of written input on the development of second language phonology. Hence, a study was conducted among three post puberty American English participants (ages 15, 16 and 17) who had no prior exposure to German. For data collection, every month they were engaged in spontaneous conversation in a word-elicitation task aimed at evaluating both phonological

and morphosyntactic development during the course of 11 months in a monthly contact. In addition, the learners were required to provide information on their German exposure and interaction in listening, reading, speaking and writing by giving rating on the amount of exposure they had. The results show that exposure to German orthography played a vital role in the non-acquisition of final devoicing in German. What is more is that there was higher percentage of orthography-induced transfer for learners who reported having higher amount of written German than those that reported lower amount.

Using the same data of the three American English participants in Young-Scholten (2002), Young-Scholten and Langer (2015) checked to see the influence of orthographic input on the development of word-initial /z/ <s> which is not a new phoneme for the English speakers as it exists in both English and German. What was new was that they were required to remap the grapheme <s> from phoneme /s/ in English to phoneme /z/ in German, and the grapheme <z> in English to phoneme /ts/ in German word-initially. Out of the data collection sessions reported above, four data collection sessions were used (i.e. first, second, midway and final months of the learners' stay in Germany). Up to 30 minutes of spontaneous conversations and four oral elicitation tasks from each of the four sessions were phonetically transcribed in the International Phonetic Alphabet and checked using Praat speech analysis software. The results of the Praat analysis revealed that, despite the existence of /z/ in both English and German, there was devoicing of word-initial /z/ by all three learners and produced voiceless [s]. Even though phoneme /z/ surfaces as [z] in word-initial position in German, the learners still produced it as [s]. The German phoneme /ts/, which is orthographically represented by <z> and new to the English learners shows development by all three learners over time suggesting that they were responding to the aural input not just transferring orthography.

More evidence is provided for learners' inferences about the phonological forms of new words in Hayes-Harb, Nicol and Barker (2010). The authors conducted a study among 33 adult American English-speakers to investigate the association between orthography and phonological forms in an auditory experiment using pseudo words with pictures. They conducted training sessions and testing using a word-matching test. The 33 participants were divided into three groups of 11 participants each at training and assigned three different conditions. Importantly for the study, the three groups all had the same auditory input and they also saw the same pictures. The makeup of the groups consisted of the *congruent orthography group* who were always exposed to the written forms of the pseudo words and the words conformed to regular English spelling and pronunciation e.g. <gufa> [gufə]. The second group

was the *incongruent/congruent orthography group* who were exposed to three levels of written forms comprising words that conform to English spelling styles, words that contain a silent letter and words that contain a discrepancy between the grapheme and phoneme e.g. the grapheme <z> mapped to the phoneme /ʃ/. The third group was *auditory only group* who were not shown the written word but were always literally presented with the string <xxxx>. After the training the participants were tested to determine whether they would be able to identify the correct word for the picture when they were presented with the pictures and heard the words. Their results revealed significant interaction between item type and group. Overall, the performance of the participants showed the impact of the written forms of novel words in relation to the relatively lower accuracy rate of the *incongruent/congruent orthography group* on incongruent orthography item types.

Evidence on the effects of auditory-induced transfer in actual L2 learning due to the effect of grapheme-phoneme correspondence is provided in Rafat's (2011, 2016) study. It examined the effect of orthographic input as an agent of L1 based phonological transfer in L2 novice learners of Spanish in Canada. The study looked at the place of auditory-orthographic input and the irregularity between grapheme-to-phoneme correspondences of the L1 and the target language (TL). Rafat's study was conducted among 40 novice English-speaking adult learners of Spanish in a picture-naming task. The participants were divided into four groups of 10 participants each and using four different degrees of orthography. At the first degree, the participants had orthographic input both at training and production. At the second degree, the participants had orthographic input at training only. At the third degree there was restriction of orthographic input to only production phase, and at the fourth degree, there was no orthographic input given at all as images were accompanied by only auditory input. The results revealed a strong effect of orthography on phonological transfer which led to non-targetlike L2 productions and the differences in grapheme-phoneme correspondences leading to phonological transfer. For instance, substitution of an L1 sound for the target sound e.g. [d] for [ð] in <codena> [kodena] for [koðena], [h] for silent letter <h> in <harapo> [haɾapo] for [aɾapo]. Although the study revealed L1 phonologically induced transfer resulting from the effect of orthographic input at learning and production, however, orthographic input at learning had a much stronger effect. For Rafat the implications of a study in pronunciation teaching where non-target pronunciation may result due to orthography are that (1) learners should be trained without orthographic input; (2) learners should be exposed first to auditory input followed by orthography in the case where the use of orthography cannot be avoided; (3) exposing learners to the same orthographic input at testing as in training does not seem to maintain the effect of orthography on learners' L2

production. She concluded that training learners using auditory only input is beneficial for L2 acquisition.

Evidence for the use of L1 Italian orthographic transparency is provided in Bassetti and Atkinson's (2015) study on the effect of orthographic forms on the pronunciation of experienced instructed L2 learners. This involved words in a series of four different studies in a word repetition task and reading aloud task. The participants in their study were young adult Italian native-speakers, made up of the same 14 participants in study one and four, and 15 participants each in studies two and three. They were all in high-school and their age range was 16-19 years. The participants had been learning English for about 10 years as a school subject. The first study focused on orthography-induced epenthesis of silent letters, in other words, epenthesis resulting due to the orthographic form of the L2 words containing silent letters. The study checked to see the level at which the L1 Italian learners of L2 English will pronounce consonants due to the spelling to correspond with the silent letters. For instance, producing a silent letter that occur within a consonant sequence resulting in production of the corresponding extra phone in word-final clusters e.g. [mb] in *comb*. The second study investigated the duration for the production of vowels when spelled with a vowel diagraph versus when spelled as a singleton for instance [i:] in *seen* and *scene*. The third study focused on the effect of morphemic spelling forms on the production of past tense marker *–ed*. Finally, the fourth study investigated L2 speakers' production of homophonic words to check whether the speakers will produce homophonic words differently due to their different spelling, for instance producing *flour* and *flower* [flaʊə] with different vowels. Their results revealed general effects of orthographic forms on the experienced learners' production of known words which led to high percentage of phone additions due to the effect of orthography. These effects were stronger in the reading aloud task than in the word repetition task.

There is also evidence of the effect of orthographic exposure leading to epenthesis to resolve complex clusters in Young-Scholten, Akita and Cross' (1999) study. Considering that in a situation where there is no orthographic input, L2 learners tend to usually simplify consonant clusters by way of deleting one or more consonants just like native-speaking children do or insert a vowel to resolve consonant clusters that are difficult for them to pronounce. Young-Scholten *et al*. examined two groups consisting of 24 English (ages 13 - 14) and 14 Japanese (ages 13 - 44) speakers on how they would resolve complex L2 Polish syllable structures that are not present in their L1. The learners were exposed to the written representations of Polish, a more complex syllable structure than both English and Japanese. The groups of learners had

three sessions over several days to learn the 18 words of one and two syllables. Afterwards they listened to the words twice spoken by a Polish native speaker while looking at a picture book. They were divided into two groups consisting of the word group who had the words under each picture written in Polish orthography and the picture group who had no written form. The learners were tested after the third session to see how many words each group had learned. For the testing, picture books with words were used and that was the first time that the picture group were exposed to the polish written words. Generally, the results show that both the English and Japanese word and picture groups added syllables, had occasional metathesis, overgeneralization of CV syllables that are present in the input, and L2 transfer by the learners (i.e. the English learners had French final stress and the Japanese learners had English penultimate stress). There was increased frequency of epenthesis and deletion in learning and testing as predicted especially by the English group. Epenthesis was increased when the written word was involved and on the other hand, deletion was increased when the written word was not involved. Young-Scholten *et al*. concluded that orthographic input is a fundamental factor which must be considered in L2 phonological developmental examination. The instances of learners using deletion and epenthesis to resolve complex consonant clusters as seen in Young-Scholten *et al's* study are supported by other studies which show evidence of this occurrence. For instance in the example in Bassetti (2008) of Spanish learners who add a vowel before the onset in Spain → 'espain' in order to break the non-permissible syllable structure of their L1 which does not allow /sp/ sequence. Also, in loanword adaptation, vowel epenthesis is used by L2 speakers as a repair strategy to break up coda clusters in loanwords. Hausa for instance has quite a number of English and Arabic loanwords which have complex syllable structures and for Hausa speakers, they will mostly insert a vowel or delete a consonant to make the syllable structure conform to their L1 structures for example in English, *professor*→ [fu.ro.fe.sa], *allowance* → [ʔa.la.wus], *plank* → [fi.laŋ.ki]; and in Arabic, *dars* [dars] → <darasi> *lesson*, *wazir* [wazir] → <waziri> *minister*, *ḥarf* [ħarf] → <harafi> *letter* (see Jaggar 2001, Alqahtani and Musa 2015). Additionally, L2 learners use metathesis, the reordering of the sequence of segments in a word as a repair strategy to resolve syllable structures that are not present in their L1, Kløve and Young-Scholten (2001). In that case, L2 phonological development recognizes orthographic input because it influences the linguistic behaviour of the L2 learners thereby resulting in less deletion and more epenthesis.

In sum, the section reviewed research which used both natural and controlled experimental approaches on the effects of orthography in phonological acquisition. For instance, Rafat's

(2011, 2016) study; Sumdangdej's (2007) study; and Bassetti & Atkinson's (2015) study show the effects of orthography on phonological transfer which leads to non-targetlike productions due to the effects of grapheme-phoneme correspondences. Also, Orthography-induced-epenthesis resulting from the production of L2 silent letters which does not exist in the phonological input of the learners L1. These studies formed the motivational base for selecting items for the tasks and intervention for this present study.

3.3.2 Phonological transfer

In the previous section, discussion on research on the effect of orthographic input showed results from various studies that reveal the occurrence of transfer as a result of the effect of orthographic input. In this section, a review of literature on some factors leading to phonological transfer is discussed.

L2 learners experience some challenges when learning a second language and one of these challenges is phonological transfer. This happens imperceptibly and unless the learner's attention is drawn in particular instances, he/she is not even conscious of the occurrence, (Lado 1957). Crystal (2008:491) defines transfer as "the influence of a person's first language on the language being acquired". He adds that "Transfer effects form part of a person's interlanguage". This definition conforms to Weinreich's (1953) description of transfer as the effect resulting from similarities and differences between the TL and any other language which was earlier (and perhaps imperfectly) acquired. According to Flege (1992), transfer occurs among L2 learners when the sound of the L2 does not exist in their L1 and they resolve it by substituting it with the nearest L1 sound.

Weinreich (ibid) describes different types of phonological transfer as used in the early days of research on L2 phonological transfer:

1) Sound substitution: whereby the nearest L1 equivalent is used in the L2 by the learner.
2) Phonological process: when the L1 allophonic variant that occurs in a different environment in the L2 is used by the learner.
3) Underdifferentiation: where the L1 does not have the distinction that the L2 has.
4) Overdifferenciation: when the L2 does not have the distinction that the L1 has.
5) Phonotactic interference: when the syllable structures of the L2 are made to agree with the syllable structures of the L1.

Hetch and Mulford (1982) further state that among other things, the differences of phonemes and allophones along with the significance of word position for allophonic differences and any sound substitution that appear will all be traceable to the influence of the L1. The authors having compared the phonemes for various L1 speakers and L2 learners of English in the order of their difficulty acknowledged transfer as a determining factor for the difficulty in producing fricatives and affricates. Developmental progress of learners played a much bigger role in influencing the way of resolving a particular difficulty by determining the sound that will be substituted for the target sound.

As we have discussed the roles of orthographic input and phonological transfer in L2 phonological acquisition, and as noted in Chapter One that this study used proficiency level as a tool for measuring the learners proficiency level, we will now turn to look at the reviews on the relevance of proficiency levels in L2 phonological acquisition in the following section.

3.4 Relevance of proficiency level on L2 phonological acquisition

On the relevance of proficiency level in L2 phonological acquisition, as it is known that proficiency level is generally used as a measurement for describing the performance of students. This is widely used in L2 research for classification of L2 learners' proficiency levels and also in measuring the effects of the learners' proficiency levels in L2 studies. In this section, reviews of previous research that investigated the effects of proficiency levels in L2 studies are provided.

Carrell (1991) investigated adult speakers of Spanish and English L1 and L2 reading ability who were foreign or L2 learners of the languages at different proficiency levels. The aim of the study was to examine the effects of L2 reading ability in the L1 and the language proficiency of the learners in the L2. Carrell's assumption was that the learners' reading ability will be affected by both their L1 reading ability and their L2 proficiency. Data was collected in two reading tasks comprising L1 and L2 passage readings in two separate 30 to 40 minute sessions among two groups of adult participants studying in the USA. The first group comprised 45 native speakers of Spanish studying English and the second group comprised 75 native speakers of English studying Spanish. They were all at different proficiency levels. The measure that Carrell used to determine their proficiency level was their instruction level. For the L1 Spanish learners, their proficiency levels include: level 3 (intermediate intensive ESL), level 4 (advance intensive), and level 6 (university level composition). As for the L1 English learners, their proficiency levels include: level 2 (first year Spanish 2nd semester), level 3 (second year Spanish 1st semester), and level 4 (3rd year Spanish grammar and composition). The proficiency levels

were determined and equated. There were higher level native Spanish speakers (levels 3, 4 and 6) than the native English speakers (levels 2, 3, and 4). Multiple regression results showed that there was high contribution of both factors (i.e. L1 reading ability and L2 proficiency levels) on the learners. There was significant effects on reading ability based on L1 reading and L2 proficiency levels. The *F*-statistics results for the two independent variables was ($F = 38.516$, $p < 0.0001$), while separate *t*-statistics results for L1 reading was ($t = 4.630$, $p < 0.0001$) and for L2 proficiency level the result was ($t = 7.594$, $p < 0.0001$). For this reason, Carrell concluded that both L1 reading ability and L2 proficiency level are significant predictors of L2 reading ability.

Another study that also looks at the effect of proficiency in L2 learning is Vandergrift (2006) who examined the listening ability of native English-speaking students learning French in two listening comprehension tests in French and in English. The participants in the study consisted of 75 adolescent English-speaking grade 8 students, ages 14-15 years old in Canada whose length of exposure to learning French ranged from 3 to 6 years. For their proficiency levels, 11 students constituted the higher ability group whose level of French proficiency was higher compared to the other 64 students who were beginner level students. Data was collected in 28 multiple choice tests in the French listening comprehension test in 45 minutes, and 22 multiple choice test in the English listening comprehension test in 30 minutes. The aim of the tests was to check the students listening ability in processing samples of extended spoken language in real-time. The results were significant for both L1 listening ability ($t = 4.047$, $p < 0.0001$) and L2 proficiency ($t = 5.480$, $p < 0.0001$). Vandergrift highlights the substantial contribution of both L1 listening ability and L2 proficiency levels in L2 listening comprehension, noting the variation in the amount of contribution whereby L2 proficiency seemed to be a much better predictor than L1 listening ability.

As stated in the introduction of this chapter that because this study looks at production and perception of L2 English, a review of studies that examined L2 segmental production and perception are provided in the following section.

3.5 L2 segmental production and perception

A great deal of research has focused on the production and to a lesser extent perception of segments in second language acquisition (e.g. Sheldon and Strange 1982; Denes and Pinson 1993; Flege 1995 & 2003; Flege, Munro and Mackay 1995; Flege, Mackay and Meador 1999; Tatham and Morton 2006; Major 2008). One of the basic assumptions is that the difficulty in

producing new sounds can be attributed to non-native perception. If learners' L2 sound system perception largely relies on their L1 sound system and they cannot perceive the L2 differences which do not exist in their L1, then they will find difficulty in producing those (Major 2008). First we will look briefly at the activities in speech production and perception.

Tatham and Morton (2011) describe speech production as an activity which involves verbal communication by the use of the vocal tract to make up appropriate sounds for communicating the speaker's thought to the listener. These activities take effect when the steady stream of air from the lungs is exhaled and produces vocal cord action. The vocal cords open and close rapidly as speech production takes place; this is characterized by the acoustic properties of the vocal tract due to the movement of the tongue, lips and other articulators which enables the production of different speech sounds (Denes and Pinson 1993). Speech production activities could vary due to various reasons. According to Perkell (1990), these variations may be between speakers due to the difference in the size of the vocal tract because of the distinctions in sex and age. Variations can also be within speakers which Strange (1989) described as resulting from factors like the rate of speech and phonetic context.

One important characteristic of speech production that shows the relationship between sounds in an utterance is *co-articulation*. Tatham and Morton (2006) define co-articulation as "the effect of the influence of an articulatory segment on adjacent segments" which shows the outcome of sounds on neighboring sounds in an utterance when they are grouped together. In this instance, some elements of a sound are present within the adjacent sound. In fact, it is difficult to isolate single sounds within a speech stream or even a single word. This is because the influence of neighboring sound result in the change of sounds in different phonetic environment and the process of co-articulation in production is motivated by the speed of speech (Jenkins 2000).

Turning to speech perception, Strange and Shafer (2008:159) defines it as "an internal mental (and physiological) process by which the perceiver recognizes incoming stimulus events as instances of mental categories". The authors noted that there is more to the detection of the differences in the acoustic signals that distinguish phonetic categories with regards to the perception of speech sounds and their contrast; adding that the accessing of internalized phonemic categories to make a decision on the identity of the stimuli is also involved. Tatham and Morton (2006) concur and describe perception as an active procedure which involves cognition and direct reference to the listener's speech production process; or the way of production which might produce the signal that was heard via the knowledge of the speech

properties which the listener has. Hence, perception can be seen as a process involving an act of communication whereby a listener obtains meaning from a speaker's speech amidst levels of events taking place from the brain of the speaker to the brain of the listener. Denes and Pinson (1993) describe this process with the speech chain as shown in the diagram in Figure 3.1.

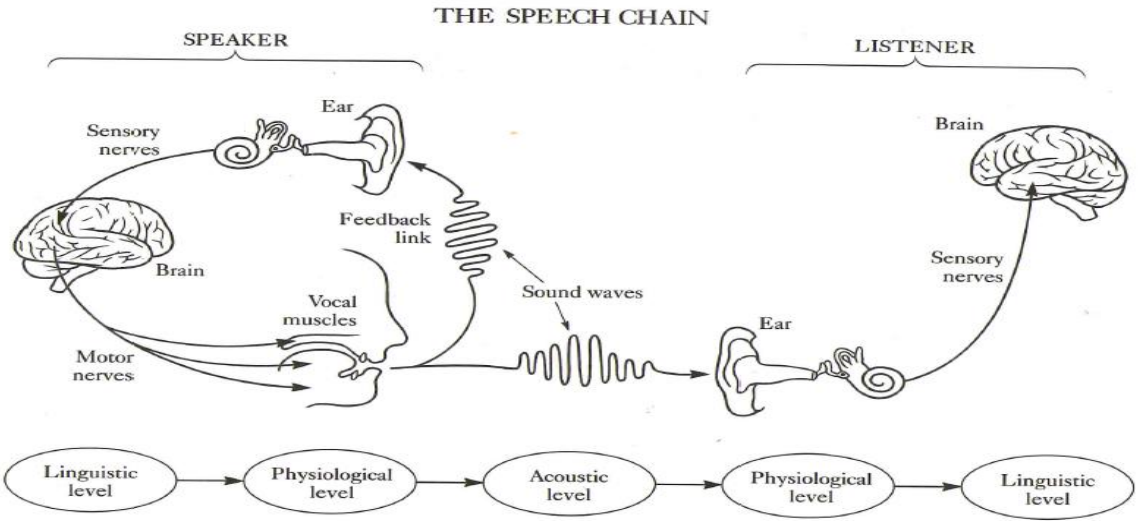


Figure 3.1 The Speech Chain diagram showing the progress of speech from the brain of the speaker to the brain of the listener (Denes and Pinson 1993)

The process describes the activity in five levels involving at the first level, the organization of the intended message by the speaker into linguistic form in words and sentences which are further arranged in the brain of the speaker. From there appropriate instructions occur through the nerves to the muscles activating the vocal cords which are responsible for the production of sounds and utterances. This leads to the second level where speech sound wave is formed as a result of movement of the vocal organs. The wave travels through the air between the speaker and the listener. The acoustic level comes in the third place followed by the listener's hearing mechanism from the acoustic nerve which forms the fourth level. This is where a certain amount of nerve activity takes place and is modified by the nerve impulse from the brain. The understanding of the speaker's message in the listener's brain as meaningful utterance marks the fifth and final level of the speech chain.

Speech perception is an activity that takes place in time; it is a process of word identification which has a measurable onset and offset, (Hume and Johnson 2001). Perception influences the cognitive domain of an individual at a particular time which results in the modified representation of the sound system in question and a well-defined sensory area which occur with the sensory manifestation of a speaker's utterance by a perceiver, (Remez 2001). In speech perception, the speakers are involved in a great deal of the whole perceptual process which can

lead them to have different perceptual responses on some occasions. On the other hand, the listener's goal is to recover the utterance of the speaker by accepting the perceptual system of the speech waveform that comes from the speaker as an input. Then the listener assigns the waveform a phonological tag which identifies the sequence of phonological elements that the speaker used in creating the waveform, (Tatham and Morton 2006).

According to Flege's (1995) Speech Learning Model (SLM) for example, the L1 and L2 phonetic subsystems of learners cannot be completely separated. However, the capabilities that govern the successful acquisition of L1 speech remain unchanged for life. In that case, it can be assumed that there should be no age differences in the way L2 sounds are perceived and produced. Moreover, if L2 sounds are perceived in a native-like manner, then they will be produced in a native-like manner.

The usual scenario in second language acquisition (and in all normal L1 acquisition) is that perception is better than and precedes production. According to Flege (2003:345), "L2 phonetic segments cannot be produced accurately unless they are perceived accurately". This claim is supported by the Perceptual Assimilation Model (PAM) developed by Best (see Best 1994 & 1995; Best, McRoberts and Goodell 2001) which predicts that the accuracy with which L2 speech sounds are discriminated will be based on how they are perceptually assimilated by the speech sounds of the L1. PAM also predicts that the degree of phonetic-articulatory similarity between L2 and L1 speech sounds may be a result of the influence of discrimination accuracy. Support for perceptual assimilation is provided for example, in Flege, Munro and MacKay's (1995) study which examined the production of English consonants among 240 adult native speakers of Italian who immigrated to Canada from Italy between the ages of 2 and 23. Also, 24 native English speakers whose mean age was 27, born in Canada. On the average, the Italian speakers had lived in Canada for 32 years. Their age range was 15 to 44 and they reported that on a daily basis, they used English more than they used Italian. The speakers were assessed on English stops and fricatives in word-initial, word-medial and word-final tokens in a forced-choice judgement task where they were presented with a list of words and were required to say the words in a carrier phrase. Flege *at al* found that after having spoken English for several years, even highly experienced native Italian speakers of English persisted in producing certain English consonants inaccurately. This may be due to the absence of an L2 consonant from the inventory of the L1 which does not guarantee eventual mastery of the L2 consonants. On the contrary, evidence is also provided of L2 learners who can produce a non-native contrast correctly even though they cannot hear these differences. For example, Sheldon and Strange

(1982) found Japanese learners of English performed better in producing the /r/ and /l/ contrast than in perceiving it. For these rare instances when production is better than perception, Major (2008) suggested that in such situations, two things may have come to play. Firstly, perhaps most L2 learners who participated in research were literate and instructed in producing contrasts that they may not have been able to perceive, and secondly, orthographic cues may have aided production.

With reference to the process of the speech chain stated earlier, one question worth asking is '*Does production come before perception or vice versa'?* Eckman, Iverson, Fox, Jacewicz, and Lee (2009) noted that there are logical possibilities which naturally show that before a learner is able to implement any given contrast, he must be able to perceive it. Moreover, the production of certain contrast by L2 learners can surpass their ability to perceive that contrast (Sheldon and Strange 1982).

On the relationship that exists between production and perception, empirical studies in L2 production and perception have provided evidence for the relationship between production and perception. For example, Flege (1993) accessed the production and perception of vowel duration cues distinction in word final English /t/ and /d/ among 49 Chinese/English bilinguals who had either learned English as a second language in childhood i.e. "child learners", or in adulthood i.e. "adult learners". Four tasks were conducted as follows: task one measured the duration of English vowels in minimal pairs task in words ending in /t/ and /d/ e.g. *beat - bead*; in task two the participants were asked to identify the final stops in CVC tokens as /t/ or /d/ in two natural-edited continua; in task three the participants perceptual sensitivity to vowel duration in voicing feature of word-final stops was measured in the same two continua used in task two; and in task four, the participants were required to imitate the duration of vowels in the two continua and in isolated words. Flege discovered that the size of the differences of vowel duration demonstrated by the participants in production and perception revealed modest positive correlation, $r = 0.54$ and $p < 0.05$. This shows that there was a significant positive relationship between the production and perception of word final /t/ and /d/ among the Chinese/English bilinguals.

Similarly, in another study, Flege, Bohn and Jang (1997) investigated the production and perception of English vowels by 20 speakers each of Spanish, German, Mandarin and Korean adult native speakers in the United States, and 10 American English speakers as control. These (Spanish, German, Mandarin and Korean) learners had arrived in the United States as adults and their duration of stay was on the average of four years. For the production test, acoustic

assessment of the participants production of /i ɪ ɛ æ/ in a forced-choice identification test was conducted by native English-speakers; while in the perception test, they were required to identify the vowels in the continua which was presented to them 11 times via headphones by pushing a button marked 'beat' or 'bit' for /i/ - /ɪ/ continuum, and 'bet' or 'bat' for /ɛ/ - /æ/ continuum. Their findings revealed production-perception significant positive correlation, r = 0.52, $p < 0.05$.

More evidence is provided for the production and perception relationship in Flege, Mackay and Meador's (1999) study among 72 highly experienced native Italian learners of English living in Canada, whose average years of living there was 35 years. In addition were also 18 English native speakers as control group. Two experiments were conducted for production and perception. For the production experiment, evaluation of the Italian native speakers' productions of 10 English vowels /i ɪ e ɛ æ o ʌ ɒ u ʊ/ was done by determining the percentage of times that the target vowels was heard by the English-speaking listeners. The participants were provided with visual and auditory prompts containing one of the target vowels in a list of four word sequence (e.g. for the vowel /i/, heed, read, deed, bead); they listened to the auditory prompts by an adult English native speaker via a loudspeaker and were required to say the words. For the perception experiment, the vowels were evaluated using a categorical discrimination test via a modified oddity format. There was a physical difference to the test stimuli as they were spoken by three different native English speakers. The learners were asked to listen and identify the serial position of an odd item among the stimuli by clicking a button. The results of the study revealed a significant positive correlation between the learners' intelligibility in their production of English vowels and their discrimination of English vowels, r = 0.62, p <0.05. Similarly, a positive correlation was also revealed in the results between the scores obtained on the discrimination and on the goodness ratings of the Italian learners production of vowels, r = 0.59, p <0.05.

The production and perception relationship is also shown in Saito and Poeteren's (2017) study of Japanese learners of English /ɹ/ performance. They conducted the study among 45 Japanese speakers who were either studying at a private institution in Japan or volunteering at neighbouring universities and colleges in Japan. They all had received six years of English instruction as a foreign language and their mean age was 30.08 years. There was also a group of baseline participants consisting 10 native Canadian Englsih speakers and their mean age was 25.2 years. Saito and Poeteren conducted production and perception test in a spontaneous and controlled production test, and forced choice identification test. For the spontaneous test in a

timed picture description task, the participants were required to produce /ɹ/ under communicative pressure without access to the orthographic forms of the target words. Afterwards, they were asked to describe 10 pictures with the target words and six distracters. In the controlled production test, the participants were required to read from a list of 40 words out of which contained 15 target tokens. Five native Canadian English speakers were recruited as raters and they individually listened to the production test tokens in a quiet room for 2.5 hours with a break of 10 minutes half way. The listeners were explicitly required to rate each token using a 9 point scale where 1 is a very good /ɹ/ and 9 is a very good /l/. In the forced choice identification perception test, the participants were required to listen to 50 minimally paired words consisting of words beginning with initial /ɹ/ and /l/ e.g. *rain* vs *lane* and there were 20 minimally paired distracters e.g. *think* vs *sink*. A Spearman correlation test was conducted to establish production-perception link for accuracy and intelligibility. Their results revealed strong correlation for the perception scores and spontaneous production performance (accuracy r = -0.405 and intelligibility r = 0.432), and between perception scores and controlled production (accuracy r = -0.628 and intelligibility r = 0.589). Saito and Poeteren concluded that the performance of the Native Japanese speakers' word initial /ɹ/ showed a relationship between L2 production and perception in relation to global qualities of accuracy and intelligibility. Overall, from the studies reviewed in this section, we could see that there is evidence that shows that a significant relationship exists between production and perception.

3.6 The effects of instruction on L2 phonological acquisition

Previously in this chapter, review of previous research that demonstrated the roles of orthographic input and phonological transfer in L2 acquisition were provided. Evidence from previous studies was provided that show their effect in L2 phonological acquisition. In this section, reviews are provided of previous studies that examined the effects of instruction in L2 phonological acquisition.

3.6.1 Effect of instruction

What is more critical in a successful communication is not based on speaker's ability to sound native-like but to be intelligible (Kenworthy 1987). The importance of intelligibility cannot be overemphasized in L2 phonological acquisition instruction. Within the past few decades, there has been a growth in the field of empirical studies on various methods of L2 pronunciation instruction. Munro and Derwing (2011) drew a timeline of some of these empirical studies

paying attention to the concepts of intelligibility and accent. They grouped their timeline into four categories:

A. Empirical teaching studies that examine students' performance before and after intervention

B. Empirical studies that use the concept of accent, intelligibility and comprehension, and/or show methodologies for the assessment of pronunciation

C. Empirical studies that show factors which influence successful teaching of pronunciation

D. Non-empirical and other theoretical discussions in the field of phonology and applied linguistics

For the purpose of the present study, which was an experimental investigation of L2 learners' performance before and after an intervention, only studies in category (A) will be reviewed.

Derwing, Munro and Wiebe (1998) conducted an experimental study among 48 English as a Second Language (ESL) learners in Canada to show the effects of instruction in L2 pronunciation. They used three types of instruction consisting of firstly, segmental instruction; secondly, general speaking habits/prosodic factors (global group); and thirdly, no specific instruction in two experiments. These learners were all at intermediate proficiency level. Their age range was 18 - 44 and they were in a full time ESL program in Canada. The first experiment was a sentence task where the learners were asked to read sentences, while the second experiment was a narrative task where the learners were asked to produce narratives impromptu. Speech samples were collected via audio recording of the learners in both experiments. This was conducted at the beginning and ending of 12 weeks of instruction in a pre-test and post-test. For the data in the first task, Derwing *et al*. had a blind rating done by 48 raters who were all native speakers of Canadian English and were studying education at the University of Alberta. In the sentence task, they found that there was improvement as a result of instruction in three aspects of oral production (comprehensibility, fluency and accent). Their results showed similar improvements by the two pronunciation-specific groups (segmental instruction and global) in comprehensibility but no significant improvement was shown for the no specific pronunciation instruction group. In addition, all the three groups improved in their accent scores. In the second task, Derwing *et al*. employed six experienced female ESL teachers as judges for the narrative task. Their result showed that only the global group revealed significant

improvement in comprehensibility and fluency. There was no improvement by any of the three groups in accentedness.

Another study by Couper (2006) also showed evidence for the effects of instruction in L2 pronunciation among 71 New Zealand immigrants mainly of Asian origin e.g. Chinese, Japanese, Korean, Thai and a wide range of non-east Asians, who were attending English language class. Their age range was 19 - 57 and they were all high-intermediate level learners with approximately 4.5 to 5.0 IELTS (International English Language Testing System) scores. The study was conducted with the aim of finding evidence for the effect of instruction on intelligibility, use of epenthesis and deletion of final consonants. Two groups of learners were involved in the study comprising the treatment group with 21 learners and the baseline group with 50 learners. To determine the suitable pronunciation areas to focus on, both the treatment group and the baseline group were given a general diagnostic test. Both groups were tested in a specific test in speaking and listening with specific focus on epenthesis and deletion in the pre-test conducted in the language laboratory. In the speaking test they were presented with 24 words containing past tenses in items 1 - 8, plurals 's' and third person in items 9 - 16, and consonant clusters with /nd/ and /ld/ in items 17 - 24 and asked to record themselves. Afterwards, only the treatment group received explicit instruction in 12 sessions over two weeks in about 30 minutes teaching sessions of short input and practice. The input included for instance, explanations of the listening test, English syllable structure, pronunciation of third person 's' rule, and working with syllables. While the practice include for instance, learners listened to their peers and were guided in perceiving differences, listening to the tests again and having the chance to repeat and record themselves, and listen and evaluate. Both groups were then tested again using the specific test in the immediate post-test. Then 12 weeks later at the end of the semester (with no further treatment), they were given the same test again in a delayed post-test. Couper's results revealed a dramatic gain and high rate of reduced error rates for the treatment group in the immediate post-test with average drop from 19.9% to 5.5%, and a slight rise in the delayed post-test of 7.5%. The results showed that instruction led to achieving much gain which to a great extent was assimilated into the learners' phonological competence. In comparison, the baseline group who received no instruction achieved no gain in the aspect of pronunciation based on the focus of the study suggesting that learners' phonological interlanguage can be changed due to the appropriate instruction.

Evidence for the effect of instruction is also provided in Champagne-Muzar, Schneiderman, and Bourdages' (1993) study which was conducted to determine whether English, Chinese,

Spanish, German and Arabic learners who went through a French phonetic training programme would improve their discrimination and production ability and as a result outperform those that did not go through the programme. The study consisted of 34 beginning level FSL (French as a second language) learners within age range of 18 - 25 divided into two groups. First was the treatment group with 15 participants who engaged in the phonetic training programme during their weekly sessions in the language laboratory in 12 lessons. The second group was the control group with 19 participants who received identical classroom instruction by the same French teacher in the language laboratory doing listening comprehension exercise as an alternative to the phonetic training programme. Both groups were tested in a discrimination and a controlled production test. In the discrimination test, the learners were asked to listen to three different subsets of words consisting of phones, intonation and rhythm. The phones subsets consisted of 24 pairs of word in which they identified on an answer sheet whether they were identical or not. As for the intonation and rhythm subsets, they were required to identify whether two sentences share identical intonation contour or rhythmic pattern. On the other hand, the production test required the learners to listen to and repeat five sentences (each of seven syllables) with varying rhythmic patterns and intonation contours. The results of the experiments revealed for the discrimination test that the treatment group outperformed the control group on phones and intonation but there was no difference on rhythm between the two groups. Equally on the production ability, the treatment group outperformed the control group with significant improvements on all the scales, i.e. phones, intonation, rhythm and global scales. Both discrimination and production ability results support the hypothesis of their study.

Evidence for the effect of instruction on children is provided in Sumdangdej's (2007) experimental study which aimed at checking whether English pronunciation instruction can be improved in Thai schools considering that English pronunciation instruction had not been treated properly in Thai classes. Data was collected in pre-test, post-test and delayed post-test in two production tests (repeat-after-tape and picture-naming) among 80 young Thai primary school learners ages 6-11. They were divided into three groups as follows: The first experimental group was the *metalinguistic group* with 23 participants who received pronunciation training with child native speaker recorded phonological input focused on raising the meta-phonological consciousness of the learners. The second experimental group was the *primary linguistic group* with 27 participants who received pronunciation training also with native speaker recorded phonological input but without consciousness raising. And the third group was the *control group* with 30 participants who only had their normal English lesson. As for their L2 English proficiency, while the control group was made up of learners who had

already started English in the first term (the data was collected in the second term), on the other hand, the two experimental groups i.e. the metalinguistic and the primary linguistic group had yet started learning English. The groups received instruction in a 20 minute daily lesson five days a week for a period of four weeks on English syllable structure and primary stress. The results from both post-test and delayed post-test revealed that the two experimental groups outperformed the control group significantly on both syllable structures and stress. Sumdangdej concluded that both experimental instruction types which used recorded native speaker input seemed to work well for the young Thai learners. Therefore suggesting that pronunciation teaching for Thai learners can be improved by using recordings from native speakers similar to those used in the experiment as a primary source of language phonological input.

Finally, Saito (2012) conducted a study on the pedagogical potential of teaching pronunciation focusing on the extent that studies portray the effectiveness of instruction in L2 pronunciation development. Saito's study also checked to see if the effectiveness of the instruction differ based on the focus of instruction (i.e. focus on form vs focus on instruction) and the type of outcome (i.e. controlled vs spontaneous productions). In the study, Saito identified, 15 quasi-experimental studies on pronunciation teaching with pre-test and post-test design. 12 of these studies were conducted in intact classes while the other three recruited participants and grouped them to either experimental group or control group. Saito found that there was significant improvement in all the intervention studies as a result of the instruction except for two studies where arguably was as a result of the students in the studies receiving 15 to 30 minutes of instruction, in other words, the short duration of instruction may have played a role in their not significant improvement. Saito concludes that not only is instruction effective for improving aspects of segmentals and supra-segmentals, but it also enhances the overall judgement of the comprehensibility of the listener.

Regarding the effectiveness of pronunciation teaching, the literature reviewed in this section reveals that improvement is possible for experimental learners in response to instruction. In particular, the literature has shown that experimental learners who had as much as 12 weeks of instruction (e.g. in Derwing *et al's* 1998 and Champagne-Muzar, *et al's* 1993 studies) as well as learners who had as few as 2 weeks of instruction (e.g. in Couper's 2006 study) equally improved after intervention.

3.6.2 Benefits of explicit instruction

There has been considerable research on the role of instruction, most of it on morpho-syntax and we will briefly discuss this before turning to research on phonology. DeKeyser (2003:321) defines an instructional treatment is being explicit "if rule explanation forms part of the instruction (deduction) or if learners are asked to attend to particular forms and try to find the rules themselves (induction)". Ellis (2006:95) adds that "explicit knowledge is held consciously, is learnable and verbalisable, and is typically accessed through controlled processing when learners experience some kind of linguistic difficulty in using the L2". These definitions are applied in research which specifically looks for evidence for the effect of explicit L2 instruction. For instance, in the meta-analysis studies by Norris and Otega (2000), Spada and Tomita (2010) on acquisition of morpho-syntax.

Norris and Otega (2000) conducted a meta-analysis of 49 different experimental and quasi-experimental L2 instruction studies that addressed the overall effectiveness of different types of instruction and the durability of the effects with respect to morpho-syntax. A comparison of the effect sizes of the different studies was conducted on the basis of five different criteria as follows: 1) instructional treatment categories; 2) studies that reported pre-test levels on the dependent variables in order to investigate the amount of observable change within the study; 3) on the basis of the duration of the instructional treatment; 4) calculating the durability of the instructional effect over time by the delayed post-test; and 5) the type of the dependent variable. Their results revealed large target-oriented gain and show that explicit instruction types are more effective than implicit instruction. The results also suggest that effective L2 instruction is durable. The mean effect size value using Cohen's *d* was ($d = 0.96$) whereas 91% of the studies revealed statistically significant findings ($p < 0.5$).

Another study on the benefits of explicit instruction is Spada and Tomita's (2013) meta-analysis which investigated the effects of explicit and implicit instruction in the acquisition of English simple and complex grammatical features. They selected 30 publications consisting of 41 separate studies and calculated their effect sizes. This was done in three phases as follows: 1) by comparing the treatment and control/comparison groups to investigate the effects of instruction at the immediate post-test; 2) by examining the delayed post-tests for the durability of the instruction; 3) by examining the effects of instruction observed within each of the groups through comparing the immediate post-test and the pre-test scores. Their results revealed an unbiased effect size for all the 30 studies investigated at immediate and delayed post-tests. The result of one-sample *t* test was statistically significant for both explicit-simple and explicit-

complex instructions ($p < 0.001$). Indicating a positive role of explicit instruction and contribution to learners controlled knowledge.

Studies (as seen in the previous section 3.6.1) have also provided evidence for the role of instruction in phonology, in improving L2 learners' pronunciation. In addition, second language acquisition research-based pronunciation instruction has also explained the importance of explicit instruction and the role it plays in the L2 classroom. For instance, Derwing and Munro (2005:388) state that "students learning L2 pronunciation benefit from being explicitly taught phonological form to help them notice the differences between their own productions and those of proficient speakers in the L2 community". Derwing and Munro conducted a research which focused on the nature of foreign accents with focus on their effects in communication to help both teachers and students in setting learning goals, identifying the suitable pedagogical significances for the classroom, and also determining the most effective approaches for the teaching. Additionally, Venkatagiri and Levis (2007) in their study provided evidence for the role that explicit instruction plays in helping learners to develop phonological awareness by having conscious knowledge of both segmentals and suprasegmentals which might subsequently be a key in L2 speech intelligibility. Their study was conducted among 17 adult college students learning English as a foreign language (EFL). Their mean age was 28 and they had been studying English in a classroom for 11 years. The learners completed 14 different tasks to evaluate phonological awareness. The tasks were used to measure six skills in the domain of phonological awareness which include: 1) Phonological blending; 2) Phonological manipulation; 3) phonological segmentation; 4) phonological sequencing; 5) rhyming and alliteration; 6) none-word reading. This was done on a computer programme written in Visual Basic 5 whereby all the tasks were presented on the computer screen. The learners' correct and incorrect responses were recorded for both typed and oral responses. 12 raters, who were English native speakers listened to the responses of the learners and judged for comprehensibility. The results of Pearson *r* correlation show a strong positive correlation between composite phonological awareness scores and the raters' comprehensibility (r [17] = 0.491, $p < 0.05$). Likewise, there was significant correlation between composite phonological awareness and phonological short term memory (r [17] = 0.502, $p < 0.05$). Venkatagiri and Levis concluded that the results of their study which show form-focused phonological instruction may contribute to the EFL speakers' comprehensibility.

The benefit of explicit pronunciation instruction leading to gains for instructed learners is also seen in Sumdangdej's (2007) study discussed in section 3.6.1, which focused on

suprasegmental-based instruction among 80 young Thai primary school learners ages 6-11. The learners were divided into three groups comprising of two experimental groups and a control group. The experimental control groups consist of firstly, the meta-linguistic group who received explicit instruction with child native speaker recorded phonological instruction training with the aim of raising the meta-phonological consciousness of the learners. The second experimental group were the primary linguistic group who also received explicit instruction also with native speaker phonological input but without meta-phonological consciousness raising. These lessons were delivered in a 20 minute lesson five days a week over the period of four school weeks. The control group had their normal English lessons. Sumdangdej's results show that the two experimental groups who received explicit instruction outperformed the control group significantly on both syllable structures and stress.

Another study which focused on segmental-based instruction is Saito (2011) who conducted an experiment among 20 adult native Japanese learners of English whose mean age was 27.6 years. The 20 learners were intermediate proficiency level learners and studying English as a second language (ESL). The study was conducted to examine the efficacy of segmental-based instruction for Japanese learners of English focusing on eight specific sounds /æ, f, v, θ, ð, w, l, r/. The 20 participants were divided into two groups of 10 participants each consisting of an experimental group and a control group. The experimental group were explained the intent of the study whereas the control group were not. This is in order not to compromise the validity of the experiment. The experimental group received one hour per week of explicit instruction in an hour tutoring session for one or two student in a laboratory setting by the researcher over four weeks. On the other hand, the control group were given free choice of whatever they wanted to do during the period (some reported that they studied in the library while others said that they took ESL classes). A sentence-reading and a picture-description task was given before and after instruction four native English raters listened to the data for accentedness and comprehensibility. ANOVA results revealed that explicit instruction benefited comprehensibility but not accentedness. Saito suggests that teaching instruction in the L2 pronunciation classroom should focus on comprehensibility which shows true improvement than accentedness.

Furthermore, as discussed in section 3.3.1, studies by Rafat (2011, 2016) and Bassetti & Atkinson (2015) provided the motivational base for selecting items for the tasks and intervention for this study. In addition, Saito's (2011) and Sumdangdej's (2007) study provided the justification for using the experimental methods used in the present study in terms of the

duration of the intervention, the experimental condition groups, and the type of input (i.e. either native speaker or non-native speaker).

3.7 Teaching of L2 English pronunciation in Nigeria

Recall in Chapter One section 1.1 on the background of this study, the role of English language in Nigeria was discussed, stating its functions in government, media, commerce, law and education. Emphasis was on its educational functions as a medium of instruction form primary four up through university and a compulsory school subject from the start of primary school, i.e. around the age of six. The structure of the English language curriculum is made up of three parts:

a) Lexis and structure: covers aspects of grammar
b) Comprehension and summary: covers aspects of reading
c) Oral English: covers aspects of pronunciation

English as a school subject is one of the core subjects prescribed by the Nigerian National Policy on Education (National Policy on Education 2004). The time allocated for lessons for all subjects is 40 minutes and unlike other subjects, English and Mathematics are taught on every school day (Monday to Friday).

As noted in Chapter One, English is not an entirely easy subject for the students in Nigeria's secondary schools particularly oral English. The reasons for this include, but are not limited to firstly, the complexity of the grapheme-phoneme correspondences of English, secondly, problems due to L1 transfer, and thirdly, the nature of the pronunciation instruction given. The first and second reasons have been reviewed in previous sections focusing on general difficulties for L2 learners. We will briefly look at reviews on the third reason, the nature of the pronunciation input.

English language usage and teaching in Nigeria have been investigated over the past few decades (e.g. Tiffen 1974, Omodiaogbe 1992, Ufomata 1996, Aduwa-Ogiegbaen and Iyamu 2006, Amuseghan 2007, Yara 2009, Fakaye 2010, Olatunji 2012, Eshiet 2014). None of these studies was conducted empirically to obtain data from a phonological acquisition perspective. As stated in Chapter One section 1.3, there is no study in applied linguistics in phonological acquisition which reports African data. This present study marks the first empirical phonological acquisition study with an African data. The studies mentioned above expounded on the problems of teaching English as a subject looking at both students' and teachers' attitudes

to the subject, and the English curriculum itself. In particular is the review of Ufomata's 1996 study which describes the situation of teaching pronunciation in Nigeria and in her words:

> In general, students are required to perceive and produce vowel/consonant contrasts and to recognise contrastive grammatical uses of stress. They are also expected to recognise attitudinal functions of intonation… The entire Oral English examination has been known to be conducted in objective tests, with no perception or performance tests given. What seems to be the case is that while the educational authorities realise the importance of teaching Oral English in schools, they find themselves unable and/or unwilling to provide the necessary funds to support effective teaching and testing of subject… Oral English is not taught in most public schools and where it is taught at all, it is done inadequately and ineffectively. Most teachers have no training in the teaching of pronunciation and they cannot be said to represent suitable models for the contrasts being tested in the examinations. (Ufomata 1996:2)

This quote by Ufomata suggests that there is a considerable problem with the teaching and testing of English pronunciation in Nigeria's secondary schools. Fakaye (2010) agrees and in his view and the views of other researchers as well this is a disturbing situation. He noted that the standard of English in the secondary schools has declined as reflected in the massive failure rates of students in the Secondary School Certificate Examinations (SSCE) as revealed in their West African Examination Council (WEAC) results. Ufomata and Fakaye's views are established by other researchers who affirmed the poor performance of students in the WEAC examinations. For instance, Atanda and Jaiyeoba (2011) show the decline in students' performance in the WEAC English language exams from 1996 (with 64.6%) to 2006 (with 29.65%). In addition, Alimi, Ehinola, & Alabi (2012) reported the massive failures of students in the 2010 WAEC exams with 75% failure in the two main core subjects, i.e. English and Mathematics. On the standard of the written and spoken English of students, Fakaye (ibid) adds that this declined cannot be compared to the standard of students during the colonial periods or even shortly afterwards. This was the era when the teachers were either English native Speakers or Nigerian teachers who have been taught by native speakers. However, they are now mostly retired. This was also the time when recorded native speaker-modelled oral English instruction was used.

One factor that contributes to students' performance in oral English is the teachers' attitude to the teaching of pronunciation. According to Jenkins (2000) a teacher of English pronunciation must be equipped with the full phonological features of the L2. This is in agreement with Abercrombie's (1949) suggestion that every teacher of pronunciation should have a minimum phonetic proficiency, even though, the more he or she knows, of course, the better. But then, a

little knowledge and skill could do. Furthermore, the competence of teachers has a very big role to play in the performance of students' L2 pronunciation. Ufomata (ibid) favoured this assertion and states that most teachers are not the right models for the teaching and testing of pronunciation because they have no training in pronunciation themselves. As can be expected, teachers of English in Nigeria are also L2 speakers of English. However, it is important that the teacher has a good understanding of the L2 phonology in order to tackle students' pronunciation problems. In addition to the L2 phonology, the teacher is also expected [if possible] to have knowledge of the L1 phonology of the learner as well in order to treat pronunciation mistakes, (Harrison 1973). Many of the Nigerian English teachers may not be too well-grounded in content and methodology. This could be as a result of different reasons ranging from and not limited to lack of qualification, lack of training/refresher courses, L1 influence and class size.

With regard to qualification, a shortage of qualified teachers of English (i.e. teachers with either a B.A. in English, B.Ed. in English, or NCE with English combined) has resulted in having teachers with other backgrounds to teach English in the secondary schools. In a survey among 20 secondary school English teachers in Gombe, Nigeria aimed at checking their attitude towards the teaching of oral English, Musa (2012) discovered that nine of the 20 teachers had no English language qualifications. Their majors ranged from Mass Communication, History, and Theology to Hausa. Although this is a small proportion of the English language teachers in Gombe, it suggest the broader picture of the situation in the state and the nation at large. This agrees with Ale's (1981) study on the difficulties facing mathematics teaching in Nigeria, also a compulsory school subject just like English. Ale states that the shortage in the number of qualified teachers has resulted in the employment of teachers from other fields e.g. Biology, Religious Knowledge, History, etc. to teach subjects they have no knowledge of. Under these circumstances, teaching pronunciation becomes a herculean task for these teachers because obviously, they cannot give what they do not have.

Teachers are not provided with training, nor are they provided with refresher courses. There is also a lack of instructional materials and lack of motivation for the teachers coupled with overcrowded classes (Amuseghan 2007). This shows the extent of government's lack of adequate attention. Hence, English teachers are ineffective, provide inadequate instruction, employ outdated and old fashioned styles of teaching, and lack the will to acquire new methods and techniques of language teaching. They also use a particular style of teaching continuously which does not yield much impact, they might even not teach pronunciation at all. (Ufomata 2006, Musa 2007 & 2012).

The problem of overcrowded classrooms is a major factor that adversely affects all the teaching, L2 pronunciation included. Although the Nigerian national policy on education section five sub-section 27 recommends that the teacher student ratio in the secondary school should be 1:40 (National Policy on Education 2004), and for effective management and class control the Nigerian Conference of Principals of Secondary Schools (ANCOPPS) recommends a maximum of 40 students per class in accordance with the national policy, (Fabunmi, Brai-Abu and Adeniji 2007), most public schools have classrooms with 60 and above students with furniture for 30 - 40. According to Owoeye and Yara (2011), the national policy recommendation on class size is unrealistic especially in urban areas due to high population where a large class size range from 30 - 366 pupils. In such cases, although teaching may take place, learning hardly takes place because the individual learner's interest and concern may not be catered for. Additionally, students' achievement is influenced whereby large classes result in low achievement of the students.

Having discussed the problems of teaching oral English in Nigeria and also previously in the chapter reviewed studies on L2 phonological transfer including L2 segmental production and perception, we will now turn to look at intelligibility and some factors that cause intelligibility problems for L2 learners.

3.8 Intelligibility

Kenworthy (1987:13) defines intelligibility as "being understood by a listener at a given time in a given situation". Kenworthy gives a more operational definition by stating that "the more words a listener is able to identify accurately when said by a speaker, the more intelligible the speaker is". An L2 learner's speech potentially becomes unintelligible when he/she substitutes the sound of the L2 with another sound. This subsequently results in the listener's perception of a different word from what the speaker intended to convey because words are made up of sounds. Schiavetti (1992) adds that for a speech to be considered intelligible there must be a match between the speaker's intention and the listener's response to the speech, which passes via a transmission structure. Schiavetti adds that speech intelligibility can be perfect when the whole list of words in the listener's response list matches with those that the speaker intends to produce. On the other hand, speech intelligibility can be zero when there is absolutely no match. Kenworthy (ibid) identified some sources of speech intelligibility problems as follows:

Sound substitution: a possible source of unintelligibility can be formed when a speaker substitutes a sound for another. Although the listener may sometimes identify the right words

because some of these substitutions are not so serious. However in some cases, the listener is left to decide what the speaker is saying because the substituted sound results in the production of another sound in English; which in turn changes the meaning of the word. For instance the post alveolar affricate [tʃ] in *watch* [wɒtʃ] will be substituted with the post-alveolar fricative [ʃ] in *wash* [wɒʃ] thereby producing an entirely different meaning e.g. in the word class *'watch out'* changed to *'wash out'*. Recall in the description of Hausa stops in section 2.3.1.1 where it was stated that because the voiced labio-dental fricative /v/ does not exist in Hausa, it is usually replaced by the voiced bilabial stop /b/ and resulting in confusion in words that are minimal pairs e.g. *ban* vs *van*, *bent* vs *vent* (see Tiffen 1974, Hoffman and Schachter 1969).

Sound deletion: speech can become unintelligible when a speaker leaves out a sound in the production of certain words. For example when a consonant at the initial, middle or final position of a word is omitted during production, it changes the meaning of the word entirely; e.g. in the word *stop* /stɒp/ when the initial /s/ sound is omitted the word changes meaning and makes it sound like *top* /tɒp/ thereby producing a different meaning e.g. in the word class *'stop it'* changed to *'top it'*.

Sound insertion: this occurs when a sound especially a vowel is added to a word for example insertion of a vowel /a/ at the beginning of a word like '*spire'* so that it becomes a bisyllabic word and sounds like '*a-spire*'.

3.9 The present study

We began with a review of previous research on three significant theoretical perspectives relevant to second language acquisition studies. These are Lado's (1957) Contrastive Analysis Hypothesis (CAH) associated with transfer from the L1, Eckman's (1977) Markedness Differential Hypothesis (MDH) associated with markedness relation between the L1 and L2, and Lenneberg's (1967) Critical Period Hypothesis (CPH) associated with the effect of age of acquisition. More importantly, this chapter also provided review of more recent studies on L2 orthographic input and phonological transfer in L2 acquisition (e.g. Bassetti 2008; Young-Scholten 2002; Hayes-Herb *et al*. 2010; Rafat 2011 & 2016; and Young-Scholten *et al*. 1999). These studies show that orthographic input could have either positive effect or negative effect on learners' phonological acquisition. The positive effects are in learners' perception and realization of the target phonemes, syllables and words, and also strong effects are seen on production. Negative effects are seen in non-target like pronunciation resulting in phone addition, substitution, omission and metathesis. A review of studies in L2 pronunciation

instruction then demonstrated the positive effects of instruction on L2 phonological acquisition. These studies provided evidence for the effectiveness of instruction in L2 pronunciation development (e.g. Derwing *et al* 1998; Couper 2006; Champagne-Muzar et al 1993; Sumdangdej 2007; Saito 2012). A further review was provided on L2 segmental production and perception, and proficiency exploring the relationship between speech production and perception and the relevance of proficiency in L2 phonological acquisition. The next section in this chapter looked at the teaching of L2 pronunciation in Nigeria which demonstrates the situation of pronunciation teaching in Nigeria followed by the final section which looked at intelligibility.

In view if this literature review, the present study set out to test whether L1 Tera/Hausa speakers L2 English production and perception at various proficiency levels can be improved through the right L2 orthographic input. This research took the form of an intervention study which aimed to experimentally investigating the effect of orthographic input on L2 English learners' at three proficiency levels production and perception of consonant clusters, digraphs in clusters, silent singletons and digraph singletons. This involved different conditions during learning. Another aim of the study is to compare the findings of this present study to others.

In order to achieve the above aims and to have evidence for supporting the research questions outlined in Chapter One section 1.3, hypotheses were generated. These are presented in the next chapter along with methodology and results of a pilot study and the main study methods.

Chapter 4: Methodology

4.1 Introduction

One of the factors causing difficulty for most Nigerian secondary school students in their oral English is the complexity of the orthography and correspondences with the phonology of oral English along with the influence of their native language. Moreover, the orthographies of Tera and Hausa are more regular and transparent (like the Italian orthography, Bassetti 2008, Bassetti and Atkinson 2015) than that of English. Method of teaching compound the problem in that teaching does not clearly illustrate the peculiarity in the pronunciation/spelling rules of the English language. This chapter provides the hypotheses and methodology of the study involving Tera/Hausa speaking adolescent students in Gombe State, Nigeria. The students completed production and perception tasks. They were grouped into three experimental condition groups and given instruction using three different methods in eight lessons over a period of four school weeks. The hypotheses of the study are presented in section 4.2, followed by discussion on the pilot study in section 4.3. Section 4.4 is on the description of the methodological approach of the main study focusing mainly on the selection of the participants. Ethics is presented in section 4.5 followed by the testing procedure for the production and perception tests and intervention procedure in sections 4.6 and 4.7 respectively. The chapter concludes with the discussion of data analysis procedure in section 4.8.

In conducting this research, the study was trialled in form of a pilot study. This was done to test the validity of the data collection instruments and methods. The pilot study also served as training for the two research assistants of the study (see section 4.7.3). The hypotheses of this study are first presented before discussing the pilot study in the subsequent section.

4.2 Hypotheses

In Chapter One section 1.4, the research questions for this study were outlined. These questions focused on whether exposure to orthography will improve Tera/Hausa learners' production and perception of consonant clusters, digraphs in clusters, digraph singletons, and a decrease in the production and perception of silent singletons. Also whether instruction method and proficiency level will play a role in the performance of the learners.

Hypotheses were generated to ensure that evidence is obtained to support these research questions as explicitly as possible.

General Hypothesis

Although Tera, Hausa and English all use the Roman alphabet they have their own orthographies, grapheme-to-phoneme correspondences differ and this will affect Tera/Hausa speakers' L2 phonology as per Chapter Two section 2.6.2

Specific Hypotheses

Based on the assumption in the general hypothesis, the following predictions are made about Tera/Hausa learners of L2 English who were involved in an experimental intervention study:

H1. The effect of instruction on experimental condition groups will improve performance between time '1' and time '2' in production and perception and as a result:

> **H1.1** - Experimental learners will be more sensitive in discriminating epenthesized stimulus when presented alongside the correct stimulus in the ABX epenthesis task.
>
> **H1.2** - Experimental learners will improve perception of grapheme-phoneme correspondences of words involving L2 English consonant clusters, digraphs in clusters, digraph singletons and silent singletons and consequently write them correctly in the dictation task due to the effect of orthography.
>
> **H1.3** - Experimental learners will exhibit better production of grapheme-phoneme correspondences than the comparison groups due to the availability of orthography in the monitored oral reading production task.
>
> **H1.4** - Experimental learners will improve in producing the test stimuli when presented with their pictures in the picture-naming task.
>
> **H1.5** - Learners with higher proficiency will improve more on all experimental condition groups.

H2. The effect of instruction will lead to a decrease in learners' production and perception error rates between time '1' and time '2' on error categories. As a result:

> **H2.1** - Experimental learners will reduce their error rate on the categories of errors.
>
> **H2.2** - There will be difference in error rates of learners whose proficiency level is higher.

H3. There will be correlation between the production and perception task performance of the groups.

Five hypotheses were initially generated with two research questions before conducting the pilot study. Upon doing the analyses of the pilot study it was realised that more investigation was needed therefore, two more research question were raised i.e., RQ1.5 Can the proficiency level of the learners influence their performance on all experimental condition groups? And RQ3 Will there be a relationship between production and perception tasks of the learners? **H1.5** and **H3** were generated to support these new research questions.

With these hypotheses, the treatment materials and testing instruments were designed. This however needed to be tested. Therefore, a pilot study was conducted. The procedure and results of the pilot study are presented in section 4.3.

4.3 Pilot Study

The pilot study was conducted to test the reliability and validity of the data collection methods and instruments. Additionally, because of the security challenges caused by the Boko Haram insurgency in north east Nigeria, the main researcher could not go personally to collect the data for the main study, so she was required to recruit and train research assistants to collect the data on her behalf. Therefore, during the main researcher's holiday in Nigeria, two secondary school English language teachers were recruited and trained as research assistants. After the training, they were required to practice what they were trained in and they followed the whole procedure of the study. The pilot was conducted by them in seven school days in Government Day Secondary School (henceforth GDSS), Zambuk, where the two research assistants work as English language teachers (see research assistants' training report in Appendix W).

4.3.1 Pilot study participants

The pilot participants were 18 Tera/Hausa speaking students between the ages of 13-16. They were randomly selected and recruited among the Senior Secondary School (SSS) year 1 students of GDSS Zambuk. As there was only one class of SSS 1 students and because the selection was on their L1 being Tera; students whose L1 was not Tera were not selected to participate. The 18 participants were randomly divided into three experimental condition groups of six participants using balloting. The numbers 1, 2 and 3 were written on pieces of paper. The pieces of papers were squeezed to hide the numbers and then shuffled and put in an empty container. The participants were then asked to pick a squeezed piece of paper each from the container and open it to reveal the number. The number on the piece of paper they picked became their experimental condition group.

4.3.2 Intervention

There were three conditions: (1) explicit instruction using both orthographic and native speaker phonological input; (2) only native speaker phonological input without any form of orthographic input, (3) so-called traditional teaching method taught by a non-native speaking English teacher using the normal teaching style that the learners were used to. All the lessons for the three groups were taught in English. The intervention instruction was administered in-between a pre-test and post-test. The instruction lessons were designed to teach the learners consonant clusters, silent singletons, digraph singletons and digraphs in clusters. The stimuli for each lesson consisted of 12 words relevant to the topic being taught.

Upon grouping the participants, they were given instruction in a 20 minutes lesson in eight lessons over the period of seven school days as shown in the next section.

4.3.3 Treatment for each experimental condition groups

Listening + orthography group: The participants in this group listened to the stimuli/activities while seeing their written forms. They were exposed to the orthographic forms in the lesson examples and class activities. The teacher(s) first introduced the lesson by explaining to the students the topic that was going to be covered and what is expected of them to do. The participants listened to the target words in sound files recorded by a British English native speaker. The duration for the recordings of the eight intervention lessons include lesson 1: 4 minutes 5 seconds, lesson 2: 4 minutes 40 seconds, lesson 3: 4 minutes 5 seconds, lesson 4: 5 minutes 5 seconds, lesson 5: 1 minute: 30 seconds, lesson 6: 1 minute 30 seconds, lesson 7; 4 minutes 5 second, and lesson 8: 4 minutes 10 seconds. They were able to see the written forms of the words while they listened to the recordings. The words were written in bold upper case with black font and size 166-point on Power Point slides. The slides were arranged to correspond with the sound recordings. The teacher(s) then asked the participants to practice pronouncing the words by repeating what they heard from the recordings. For their daily class activities, they were divided into small groups and given blank sheets of paper to write down words they have learnt from the lessons in order to practice how to correctly spell the words. Afterwards, a member from each group presented their group work to the rest of the class, then the teacher commented on the students' group activity and answered the participants' questions if there were any.

Listening only group: This was the first comparison group. The participants only listened to the recorded productions of the intervention stimuli/activities (same recording used with the listening + orthography group) without seeing their written forms. They were not exposed to any form of orthography whatsoever. They only heard the pronunciation of the target words from the sound files recordings as produced by a British English native speaker, but they could not see their written forms. For their class activities, they were divided into small groups and given blank sheets of paper to only draw images representing words they have learnt from the lessons but not using orthographic forms to practice their pronunciation.

Traditional teaching method group: This was the second comparison group. The participants were taught the same lessons using the normal traditional teaching style that they were used to being taught using lesson notes and chalkboard by the research assistants who were non-native speakers of English. Nothing was new to the teachers or students in the method of instruction. The teachers taught them using their own style and pronunciation. They were exposed to orthography both during the lesson and class activity. For their class activities, they were divided into small groups and given sheets of papers to write down words from the lessons and practice their pronunciation and writing them correctly (same as the listening + orthography group).

4.3.4 Test stimuli preparation

As stated in the introduction of this chapter, this study involved production and perception pre-test and post-test in four different tasks. The tasks consisted of 40 test tokens of isolated words. For the perception, ABX epenthesis and dictation were used. For the production, elicited oral production via picture-naming and reading aloud were used. The 40 test tokens were divided into nine categories comprising the following:

1) Two-consonant onset
2) Two-consonant coda
3) Three-consonant onset
4) Three-consonant coda
5) Initial silent singletons
6) Medial and final silent singletons
7) Initial digraph singletons
8) Final digraph singletons
9) Digraphs in clusters

There were two rationales for designing the lessons to begin with consonant onsets and end with digraphs in clusters. The first rationale is in order to start from simple to complex. Considering consonant onsets clusters as less complex since there are only two consonant alphabets, whereas digraphs in clusters are more complex since there could be up to three to four consonant alphabets and sometimes a vowel. The second rationale is from the front to the back, that is, from the beginning of a word to the end based on what is the normal way of introducing things in a standard text.

These were used in both pre-test and post-test for testing the participants in the four tasks using the same set of tokens and in the same order. After the intervention lessons, the same stimuli as the pre-test were repeated in the post-test. This was done in order to test the hypotheses. The words used in the stimuli were in Received Pronunciation (RP) taken from the Oxford Advanced Learners Dictionary online. The test stimuli in the dictation and epenthesis tasks and the intervention instruction lessons were recorded by a male British native speaker. The duration for the recordings of the test stimuli consisted of the following: dictation task: 5 minutes 20 seconds and epenthesis task: 6 minutes 40 seconds. All recordings were made using a Sony digital audio recorder, model number: ICD-PX232. The words for the reading aloud task were in bold upper case with font size of 166 on Power Point with each word per slide. The pictures for the picture-naming task were obtained online from Google images and they were chosen to precisely present the tokens. The pictures were organized on Power Point with a picture per slide and their sizes on the slides were19cm high and 25.5cm wide.

The justification for using two tasks for each test was in order to see the effect of orthographic input on both the learners' production and percption since people use reading all the time. In doing so, one test involving the use of orthography was employed for both production and percption tests, i.e. dictation elicited written production task for the perception test and reading aloud task for the production test. Also, the justification for choosing the aforementioned tasks is based on the fact that a great body of research has effectively used both natural and controlled experimental approaches in studies on the effects of orthography in L2 phonology. For example, word-learning (e.g. Young-Scholten, Akita & Cross 1999), spontaneous production (e.g. Young-Scholten 2002), repeat-after-tape and picture-naming (e.g. Sumdangdej 2007), word-matching (e.g. Hayes-Harb, Nicol and Barker 2010), picture-naming (e.g. Rafat 2011, 2016), and reading aloud/word repetition (e.g. Bassetti and Atkinson 2015). These methods have effectively supported the provision of empirical evidence for the effect of orthography in L2 phonological acquisition. In addition, other tasks used in L2 phonological acquisition studies

include, spelling (e.g. Holm and Dodd 1996), writing (e.g. Hanaoka 2007), and sound discrimination (e.g. Leung 2012).

To this effect, the main researcher adopted a picture-naming task, reading aloud task, discrimination task and a dictation task for this study. She used the styles of these studies as guide and designed her own tasks using isolated words which could be better remembered by the participants than continuous speech. These tasks were used in both pre-test and post-test. The stimuli for the tasks as earlier stated consisted of 40 test tokens of isolated words.

As for the stimuli that was used for testing the students in the four tasks, the same set of tokens and in the same order were used in all the task in both production and perception pre-test and post-test. The list of the words used for the pilot study stimuli are presented in Table 4.1

Table 4.1 List of test tokens for pilot study

Position of tokens	Word list
Two-consonant onsets	Clock, Block, Frog, Drum, Tree, Brush, Snail, Snake
Three-consonant onsets	Stream, Spray, Spring, Square, Screwdriver
Two-consonant-codas	Hand, Tent, Lamp, Nest, Desk, Tank
Three-consonant codas	Ants, Bulbs, Films
Initial silent letters	Wristband, Pneumonia, Knitting
Medial and final silent letters	Castle, Whistle, Wheelbarrow, Comb, Thumb
Initial digraphs	Church, Phone, Ship
Final digraphs	Ring, Teeth, Duck
Digraphs in clusters	Bench, Orange, Branch, Syringe

4.3.5 Testing procedure

After recruiting the participants, the participants' proficiency level was measured firstly using the Oxford Quick Placement Test (henceforth OQPT) version 2 (part 1). Thereafter, the two production tasks and two perception tasks described in the previous section were used for collecting data in the pre-test.

4.3.5.1 Perception tests

The perception test involved listening to the sound file of the perception stimuli. This was played in a 15 minute collective listening test with the 18 participants all at once in a computer room. First, an ABX epenthesis perception task was administered then a dictation elicited written production task. A KNSTAR band radio (model number: NS-076U) was used to play the sound files from a USB stick. The radio was kept on a desk at the front of the class and the volume was put on maximum such that the entire study sample could hear the sounds. The radio

was first tested to see if the volume was loud and the recording was clear enough for a group listening test in the computer room before using it. The aim of the perception tasks was to test whether the learners would firstly, perceive spoken words (ABX task) and also spell them in response to hearing them.

Epenthesis perception task

The 40 test tokens in Table 4.1 were used for the epenthesis task in an ABX discrimination task. The stimulus was recorded on a SONY digital audio recorder by a male British English native speaker and copied on a flash drive. A KNSTAR band radio was used to play the sound files from the flash drive. There was a two-second interval between each word in A, B and X and the transition between each sequence was ten seconds. In this task, three stimuli for each of the 40 tokens were presented in a sequential order. A vowel was inserted in one of the stimuli in either A or B. The matching stimuli in X could also have a vowel inserted in some of the tokens. In order not to recruit the metalinguistic of the students, the stimuli were scattered randomly such that the right form of the words could be in either A, B or X position. In this task, the students were asked to listen attentively to each of the sequence in A, B and X for all the test tokens and choose the A or B option that matches with X. This was played only once and the students were required to write down their answer (either A or B) on a sheet provided. Table 4.2 shows random examples of sequences of the ABX epenthesis task tokens. The choice of the epenthetic vowel for the task was based on the possible Tera epenthesis vowels as the main determining factor. Also, the quality of the vowel (i.e. the phonological features of height, frontness or roundness) was also considered in the choice of the epenthetic vowels so that the epenthetic vowels shared the same features as the lexical vowels in the stimuli.

Table 4.2 Epenthesis task sample

A	**B**	**X**
BULOCK	BLOCK	BLOCK
KNITTING	KINITTING	KNITTING
FENCEI	FENCE	FENCE
DUCK	DUCKU	DUCK

Dictation elicited written production task

A script of the 40 test tokens was recorded on a SONY digital audio recorder by a male British English native speaker and copied on a flash drive. A KNSTAR band radio was used to play the sound files. The transition between the words was 10 seconds within which each word was

repeated twice. The students were required to listen attentively to each production as it was said and then write down the word they heard on an answer sheet.

4.3.5.2 Production tests

The production test involved a 10 minute meeting between the research assistant(s) and the participants individually. The participants were required to produce the test tokens first in the picture-naming task and then the reading aloud task. The participants' production was recorded on a SONY digital audio recorder model number: ICD-PX232. The production tasks were administered with the aim of checking whether English orthography will result in errors and what type in their production of English consonant clusters, digraphs in clusters, silent singletons and digraph singletons.

Elicited oral production picture-naming task

Images of the 40 test tokens were prepared on Power Point slides with one picture per slide in a full page, landscape orientation. The pictures were 19cm high and 25.5cm wide. There was three seconds transition between the slides. The pictures were shown slide-by-slide to the participants who had to say the name of the image in the picture on each slide while their production was being recorded on a Sony digital audio recorder.

Reading aloud task

Words of the 40 test tokens of isolated words were arranged on slides with a word per slide. The words were written in boldface upper case in black and size 166-point. Like in the picture-naming task, the slides were arranged on Power Point with three seconds transition between the slides. The participants were required to read what was on the slide while they were being recorded on an audio recorder.

4.3.5.3 Proficiency level test

As a means of confirming the English level of the participants before administering the pre-test, a proficiency test was administered to the participants using the OQPT paper based version 2, questions 1-40 (part A). This is a flexible English proficiency test that is used for learners of all grades and ages, which is meant to provide teachers with reliable and time-saving method of identifying the English level of students. There are two forms of the test, the computer based and the paper based, which are both multiple choice types. The paper based takes about thirty minutes to administer and answers to the test are written on the answer sheet and marked using

answers provided. The test is in two parts, part A is taken by all the candidates whereas part B is taken by only the candidates with higher ability, that is, those who scored 36 and more from part A, (Geranpayeh 2003). Table 4.3 provides the possible OQPT score bands (see Appendix C for sample of the paper based OQPT.)

Table 4.3 OQPT table for the paper and pen possible scores

Level	Description	Paper and pen test score
0.1	Beginner	0 – 9
1.2	Breakthrough	10 – 15
1	Elementary	16 – 23
2	Lower intermediate	24 – 30
3	Upper intermediate	31 – 40
4	Advanced	**Taken only by those who score 36 and more**
5	Very advanced	

Recall in Chapter One it was mentioned that the Nigerian National Policy on Education prescribes that students are exposed to English in primary one as a school subject and from primary four until university as a medium of instruction. Going by the statement in this policy, it is expected that the students should have similar English ability considering that they have the same amount of exposure. However, their abilities vary. They do not all have the same advantage. The urban-rural area variation is a major factor whereby students in the urban areas have more exposure to English language than their counterparts in the rural areas who have limited exposure. For example in Tera speaking communities, recall in Chapter Two section 2.2, it was mentioned that the L1 is mainly used by the speakers in family and in village life while English is used mainly in school. Having said that, although the learners in this study have the same amount of schooling exposure, however, their abilities vary. There were weak abilities, medium abilities and strong abilities; and how they performed in the OQPT reflect their abilities.

4.3.6 Observations from the pilot study procedure

During the pilot study, observations were made about aspects of the study which were either suitable and did not need to be changed, or not suitable and needed to be adjusted before the main data collection. Firstly, the timing allocated for conducting the tasks in the pre-test, instruction classes and post-test was confirmed to be adequate. The 15 minute collective listening test in the perception test saved much time that would have been spent on individual testing. This was a good practice that was maintained during the main study. Secondly, some of the pictures in the picture-naming task items were either difficult for the participants to

identify, or, the participants misinterpreted the pictures. For instance, the picture of *castle* was mostly misinterpreted as *house* or *church*, *branch* as *tree* or *leaf*, *stream* as *water* or *river*, *tent* as *room* or *house*, and *ring* as *finger*. To this effect, the picture-naming task was reviewed and refined before conducting the main study, and for those words that the participants had difficulty identifying pictures of or misinterpreted were changed. Lastly, the major challenge was the lack of reliable electricity supply. This rendered a laptop with Power Point slides impractical. Instead, flip charts of the printed Power Point slides were used and it was confirmed effective. The pictures for the picture-naming task were printed in colour while the reading aloud task and the instruction lessons were printed in bold black and white. These changes are further discussed in the main study data collection instruments and experiment details in section 4.6

4.3.7 Pilot study data results and discussion

For the analysis of the tests, the OQPT and perception tests in epenthesis and dictation tasks were marked using a marking scheme prepared by the main researcher, and correct answers were awarded 1 mark and then calculated. Also, the production tests in picture-naming and reading aloud tasks were run through Praat speech analysis software, and awarded marks using the main researcher's judgement for correctness. The marks for the production and perception tests were then reported numerically using SPSS Repeated Measures ANOVA analysis.

4.3.7.1 Pilot study results

In this section, results of the OQPT are presented to show the proficiency levels of the 18 participants from the three experimental condition groups consisting of listening + orthography group (LIST + ORTH), listening only group (LIST), and traditional teaching method group (TTM). This is followed by the SPSS repeated measures ANOVA results on the four tasks, including the overall mean difference and percentage performance of the groups. First, the descriptive statistics of the OQPT of the 18 participants is provided in Table 4.4.

Table 4.4 Descriptive statistics of proficiency level of the participants

Proficiency level	Frequency	Valid Percent	Cumulative Percent
Breakthrough	4	22.2	22.2
Elementary	11	61.1	83.3
Lower intermediate	3	16.7	100.0

Table 4.4 shows that out of the 18 participants there were four breakthrough-level learners (lower level based on OQPT scores) with a score range of 11-14, followed by elementary-level

learners with the highest number of learners with 11 participants who had a score range of 18-23, and then lower intermediate-level learners consisting 3 participants (higher level based on OQPT scores) with a score range of 25-27. Note that all the participants had the same amount of schooling exposure.

Table 4.5 Pilot study OQPT proficiency level by experimental condition group

Proficiency level	**Experimental condition groups**			**Score range**
	LIST + ORTH	**LIST**	**TTM**	
Breakthrough	1	1	2	10 - 15
Elementary	4	3	4	16 - 23
Lower intermediate	1	2	0	24 - 30

As earlier mentioned, the 18 participants were grouped into the different experimental condition groups using balloting. The OQPT score was not a determining factor as to which experimental condition group they would belong. Table 4.5 shows the breakdown of the total number of the participants by proficiency levels in each group. There was roughly similar proficiency levels in the groups but not evenly distributed. There were more elementary-level learners in all the three groups with four learners each in the listening + orthography group and the traditional teaching method group, and three learners in the listening only group. The listening only group had two lower intermediate-level learners whereas the traditional teaching method group had none.

A repeated measures ANOVA test was conducted to show whether there was significant improvement between pre-test and post-test of each of the four tasks by the three experimental condition groups. The independent variables consisted of the three experimental condition groups while pre-test and post-test in the four tasks made up the dependent variables. In addition, a paired sample t-test was also conducted with the pre-test and post-test in the four tasks as the paired variables to show whether there was significant difference between pre-test and post-test in all the tasks. In both tests the p value is statistically significant at the level $\leq .05$ (see appendix X.1 to X.4 for the pilot study tables of the repeated measures ANOVA results).

The results in appendix X.1 to X.4 revealed a statistically significant improvement $p \leq .05$ by the combined groups on the four tasks (epenthesis task: $p = 0.024$, dictation task: $p = 0.001$, picture-naming task: $p = 0.001$, and reading aloud task: $p = 0.001$). The mean scores of the groups at pre-test and post-test in the four tasks show the variation between them with asterisk on the bars of the better improved group (see appendix X.5.1 to X.5.4 for the Figures of the mean scores).

The epenthesis task mean scores in the bar chart in appendix X.5.1 revealed the listening + orthography group (with difference of 8.34 points) as the better improved group followed by the listening only group (with 3.5 points). The traditional teaching method group on the other hand did not improve (with a drop in mean score of -0.84 points). Although the sample was small, there was no logical explanation as to why there was a drop in their performance, the only possible reason could probably be because of the proficiency level of the learners. Note that during the pilot study, proficiency level was only used as a means of confirming the proficiency level of the participants before administering the pilot test. However, because of the findings from the pilot study results which suggest that proficiency level could play a role in their performance, RQ1.5 was raised which states that: Can the proficiency level of the learners influence their performance on all experimental condition groups? To support RQ1.5, **H1.5** was generated which states that learners with higher proficiency level will improve more on all experimental condition groups. There were only breakthrough-level and elementary-level learners (lower proficiency levels based on OQPT scores) but no single lower-intermediate-level learners (higher proficiency level based on OQPT scores) in the traditional teaching method group as shown in Table 4.5. Another possible reason could be that being a discrimination task type, the traditional teaching method group were not as good at guessing the correct token that matches with X between A and B as the listening + orthography group and the listening only group. The mean scores of the other three tasks i.e. dictation, picture-naming and reading all revealed improvement between pre-test and post-test by all the three groups (see appendix X.5.2 to X.5.4 for the bar charts). Overall, the listening + orthography group revealed more improvements on the tasks than the listening only and traditional teaching method groups except on the picture naming task where the listening only group had better improvement. The performance of the listening + orthography group on the dictation and reading aloud task revealed the effect of orthography by their performance as a result of having orthographic and phonological input at instruction. The overall percentage performance of the groups is shown in Figure 4.1 below.

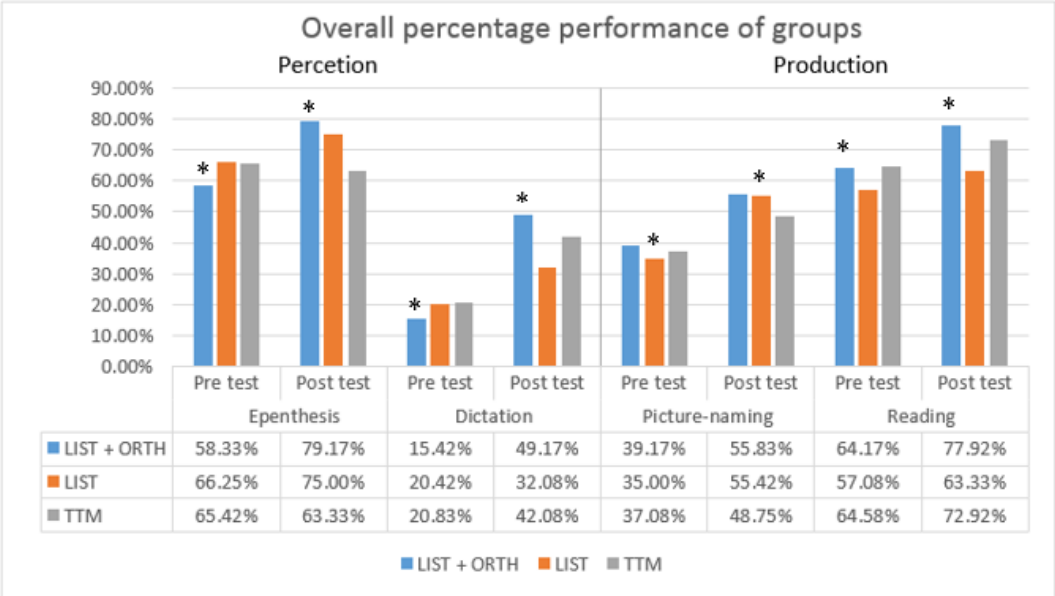


Figure 4.1 Pilot study overall percentage performance by group

In sum, the overall percentage performance of the groups shown in Figure 4.1 clearly shows epenthesis task as the task with the highest performance while dictation task had the lowest performance. However, the mean difference between pre-test and post-test and the percentage scores shows that even though the groups performed well on the epenthesis pre-test the difference between their improvement in the post-test was higher on the dictation task (for just the listening + orthography group and traditional teaching method group) which suggest the dictation task to be the better improved task.

4.3.7.2 Pilot study discussion

The results reported in section 4.3.7.1 are reviewed in this section in light of the hypotheses of the study. The results reveal that except for the picture-naming task result that showed better improvement by the listening only group, the results of the epenthesis task, dictation task and reading aloud task support the hypotheses that the listening + orthography group who received explicit instruction with both native speaker auditory input and orthographic input will improve better than the listening only group and the traditional teaching method groups on all the four tasks. The performance of the learners showed that there was vowel epenthesis, deletion, consonant cluster/digraph reduction, substitution, orthographic influence, loanword induced transfer and metathesis.The learners inserted vowels in onset and coda clusters/digraphs. For instance, [u] epenthesis in *clock* pronounced [kulɔk], *drum* pronounced [durʌm], [ɪ] epenthesis

in *tree* pronounced [tɪriː], *syringe* pronounced [sɪrɪnʤɪ][19] and *bench* pronounced [bɛnʧɪ][20]. Deletion mostly occurred in three-consonant coda clusters, for instance, *films* became [fim]. To further support the hypothesis, orthographic production occurred in silent singletons where the letters that have graphemic quality but no phonological correspondence were produced, for instance <p> in ***p**neumonia* [**pe**nɪmonɪja], <t> in *cas**t**le* [kaːs**ti**l], <k> in ***k**nitting* [**kɪ**nɪtɪŋ] were produced and also involved vowel epenthesis. Also, in diagraph singletons e.g. <p> in ***p**hone* was produced. In addition, substitution occurred in consonant diagraphs for instance, the voiceless postalveolar affricate [ʧ] in *ben**ch*** and *bran**ch*** were substituted with the voiceless postalveolar fricative [ʃ] and pronounced [benʃ] and [branʃ], and the voiceless dental fricative [θ] in *tee**th*** was substituted with the voiceless alveolar stop [t] and pronounced [tiːt]. The substitution of [θ] with [t] is not surprising though considering that the dental fricative [θ] neither exists in Tera nor in Hausa. With these findings on the nature of errors that the learners made in their oral and written productions, a qualitative phonological analysis was strongly considered for the data of the main study.

Furthermore, there were cases of metathesis occurring in the spelling and production of the learners. This is a process of reordering the sequence of segments, (O'Grady, Dobrovolsky & Katamba 1996). Instances of metathesis were mostly in the production or spelling of *des**k*** where the /sk/ sequence were reordered becoming 'de**ks**' which also violates the sonority sequence. This phonological process was initially not predicted as one of the things that the learners will do prior to the pilot study. Therefore in the main study, metathesis was considered as a category to look out for alongside epenthesis, substitution, deletion, orthographic production and loanword-induced transfer. Additionally, for the SPSS analysis in the main study, group interaction and effect size will be checked to look at how much the independent variables affect the dependent variables, and post-hoc to look at the variation between the independent variables. Also, qualitative phonological analysis will be conducted using linear phonological operations and rules to phonologically explain different errors that the learners made during the production and perception tests.

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[19]Two reasons could have influenced the production for *syringe* as [sɪrɪnʤɪ]. Firstly, it could be the effect of the L2 English orthography whereby the learners produce the vowel alphabet at the end of the word giving it a phonemic value. Secondly, because it is a loanword in Hausa that is pronounced [sɪrɪnʤɪ].

[20]The vowel epenthesis in *bench* → [bɛnʧi] could be as a result of it being a loan word just like [sɪrɪnʤɪ] from English-to-Hausa-to-Tera. Hausa and Tera do not have CC or CCC clusters, therefore the learners resolve the English clusters by inserting a vowel. Recall that it was stated in Chapter Two section 2.1 that Tera speakers are bilinguals just like the majority of people in northern Nigeria who speak Hausa as a lingua franca.

In sum, measuring the effectiveness of the intervention generally, although the differences in performance of the learners between pre-test and post-test was generally minimal, some of the errors made during the pre-test were corrected due to the intervention and the improvements were revealed in the results of the post-test. Note also that the duration for the intervention in the pilot test was short considering that what was planned to be covered within four school weeks in the main study was covered within seven school days during the pilot test.

In the following section, the justification for using the methodological approach used in the study are discussed followed by discussion of other significant issues related to the main study.

4.4 The main study

4.4.1 Participant sample

Building on Lenneberg's Critical Period Hypothesis (CAH) discussed in Chapter Three section 3.2.3, the effect of age on the ability to acquire native-like pronunciation of a language is within the period from early infancy to puberty. This period is perhaps the "normal" language learning period. It is for this reason that the participants were selected among adolescent students in JSS3, aged 12-16. Their age range falls in the later stage of the critical period, that is, puberty. In addition, their selection was based on the fact that they had been learning oral English at school as part of the English language curriculum. Importantly, the study was designed primarily for secondary school learners.

There were Fulani and Waja native speakers from neighboring villages and hamlets who attended the secondary schools where the study was conducted. Also, there were other students whose parents were working and were resident in the communities (Zambuk and Difa) that were not Tera speakers. These learners were all excluded from the study. The two towns (Zambuk and Difa) where the study was conducted are 8 kilometres (4.97 miles) apart from each other. The participants were recruited from the two neighboring communities because the number of the Tera-speaking students in JSS3 in only one community was insufficient for the study, and of the need to recruit participants who had received the same amount of exposure to English in school.

4.4.2 Participants

The main study sample consists of 73 school boys and girls[21] who were recruited among JSS3 students from JSS Zambuk and JSS Difa aged 12 to16. Because the focus of the study is on L1 Tera-speaking L2 English learners, only students whose native language was Tera were selected for the study, thereby excluding those students whose native language was not Tera. All the participants were bilinguals because Hausa is a lingua franca spoken in northern Nigeria, as noted earlier. The participants comprise the following numbers:

Government Junior Secondary School Zambuk: (N= 35)

Government Junior Secondary School Difa: (N= 38)

A participant recruitment questionnaire was used for the selection of participants. The questionnaire sought information about the participants' personal details, knowledge and use of languages including L2 English use (see Appendix N.5, O.4 and P.4 for recruitment questionnaire in English, Tera and Hausa respectively).

4.4.3 Test procedure

As was earlier mentioned in section 4.3.5, two perception and two production tasks were employed for the data collection. The justification for using two tasks for each as previously mentioned was to measure how reading interacts with perception and production tasks. Details of the procedues are discussed in section 4.6.

4.5 Ethics

This study specifically targeted recruiting participants through the principals of the schools. These participants were children under the age of 18. It is a requirement that such a study needs ethical approval from the university and permission locally from the area where the study was conducted. To this end, permission was sought from the State Universal Basic Education Board (SUBEB) in Gombe, Nigeria (see Appendix Q for the approval), and ethics approval was sought also from Newcastle University.

The main instruments for the ethical approval included a participant information sheet, consent form, risk assessment and debriefing sheet. These were all provided in English, Tera and Hausa. In this section, a description of each of the instrument is given.

[21]A total of 80 students were initially recruited but by the end of the study seven students had dropped out.

4.5.1 Participant information

This is a document that included basic information on the details of the study and of the researcher conducting the study. The information sheet was the first document that was given to the participants upon recruiting them. It gave insight on the aims and purpose of conducting the research. Information about selection criteria and information on voluntary participation was also provided. The information sheet stated that participation was entirely voluntary and participants had the right to withdraw at any time without any consequences. In addition, full details of what was involved in participating in the study were given including the benefits and risks of participating. To ensure that confidentiality was maintained, the issue of confidentiality, anonymity, storage, usage and dissemination of data were explicitly explained (see Appendix N.1, O.1 and P.1 for the participant information sheet in English, Tera and Hausa, respectively).

4.5.2 Participant consent

Participants who willingly volunteered to participate in the study were given a consent form to sign. The document required them to confirm that they understood the details of the research as provided on the information sheet. There was a list of 10 items on the consent form which required the participants to read and tick the boxes next to each item to confirm their consent. The list included information on voluntary participation, nature of data collection, usage and storage, confidentiality and anonymity (see Appendix N.2, O.2 and P.2 for sample of English, Tera and Hausa versions of consent form).

4.5.3 Participant risk assessment

An assessment of the physical, psychological and environmental risks of participation was given in the risk assessment sheet. This document explained potential risks associated with the study, if any. The physical risk explained the kinds of equipment used for the data collection and the participants' travel to and from the study location. There was no known psychological risk associated with the study, as such, none was stated. As for the environmental risk, the location of study was the participants' schools which posed no additional risk for them, because it was the same place where they normally went daily to attend school. The only possible risk was associated with safety and security which might arise in the event of unanticipated terrorist attack by the Boko Haram insurgents which was then at its height in the north-east of Nigeria. Measures for handling this risk were explained. These risks were no different from the risks in attending school, which they were doing. In addition, a letter confirming the assurance of safety

of the participants and research assistants was obtained from the Nigerian Police force in Gombe (see risk assessment in Appendix N.3 and police letter of confirmation of security in Appendix R).

4.6 Data collection instrument and experiment details

Based on the observations from the pilot study discussed in section 4.3.6, some of the tasks and test procedures needed to be changed; only the changes that were made on the particular tasks or procedures will be discussed in this section.

4.6.1 Testing

The testing procedure for both perception and production test were maintained from the pilot. Changes made were in some of the test tokens that were difficult for the participants to identify as mentioned in section 4.3.6. The revised set of test tokens are shown in Table 4.6 Some of the test tokens contain English loanwords in Hausa/Tera. The rationale for including these words is because they are words that the learners actually knew and they also contain consonant clusters or digraph. These loanwords include: *block, table, tank, whistle, church, bench, syringe, and fridge*. In addition, as earlier mentioned in section 4.3.5 on pilot testing, the order of the tokens is based from simple to complex basis and from the front to the back. That is, considering two-consonant onsets as more simple and coda digraphs in clusters as more complex. The tasks were designed using isolated words which was considered easier and could be better remembered by the learners.

Table 4.6 List of words used in the tests

Token types			Word list
2-member cluster	Onsets	Cl, Cn, Cr (Consonant + /l/, /n/, /r/)	Clock, Block, Snake, Brush, Drum
	Codas	Cl, Ck,Cs (Consonant + /l/, /k/, /s/)	Table, Desk, Ink, Fence, Tank
3-member cluster	Onsets	sCC (/s/ + 2 other Consonants)	Spring, Strawberry, Straw, Screwdriver, Squirrel
	Codas	/nts/, /nds/, /mps/	Ants, Hands, Lamps, Plants
Silent singletons	Initial	kC, pC, wC (silent letter followed by consonant)	Knife, Knitting, Pneumonia, Wristwatch,
	Mid/final	CtC, Ch, gC, Cb (silent letter between, before or after a consonant	Whistle, Wheelbarrow, Signboard, Comb
Digraph singletons	Initial	<ph>, <sh>, <ch>	Phone, Shoe, Ship, Chair
	Final	<th>, <ng>, <ck>, <ch>	Teeth, Ring, Duck, Church
Digraphs in clusters		C + ch, C+ ge[22],	Bench, Branch, Orange, Fridge, Syringe

4.6.2 Procedure

The procedure for testing as mentioned in the previous section was the same as the pilot study with just a few changes due to the observations from the pilot study. In this section only the changes made on the materials and procedures are discussed.

4.6.2.1 Perception tests

As mentioned in section 4.3.5.1, the perception test was conducted in 15 minutes as collective test for the epenthesis task and dictation task which saved much time that would have been spent on individual testing. This was successful and maintained in the main study. This was done for 20 students at once in a quiet classroom. Nothing was changed in the procedure for the perception test except for the change of some of the test tokens that were difficult for the participants to identify during the pilot study. Having changed some of the words, a new recording was made again by a male British English native speaker using a Sony digital audio recorder, model number: ICD-PX232 and copied on a USB stick. A KNSTAR band radio (model number: NS-076U) was used to play the sound files from the USB stick. The same procedure used in the pilot study for the epenthesis task and dictation task were used (see Appendix A for the dictation ABX epenthesis task test tokens).

[22] Recall in Chapter Two section 2.5.2 item (c) of Example 2.27 for the English spelling and pronunciation rules, it was given that <g> is pronounced as /ʤ/ when it is followed by <i, e, y>.

4.6.2.2 Production tests

As stated in section 4.3.6, the use of Power Point slides from a laptop as originally intended for the study was impractical due to unreliable electricity power supply. Therefore, the Power Point slides of the pictures for the picture-naming task and the words for the reading aloud task were printed out and arranged on flip charts. The procedures are discussed below

Picture-naming task

Images of the 40 tokens were prepared on Power Point slides with each picture per slide in a full page, landscape orientation. The sizes of the pictures were 19cm high and 25.5cm wide. The slides were then printed in colour and organized on flip charts. The pictures were shown to the participants for approximately three seconds before the next picture was flipped over. The participants were required to say the name of the image in the picture on each slide for the 40 tokens in 5 minutes while their production was recorded using a Sony digital audio recorder (see Appendix B for the sample of the pictures).

Reading aloud task

The 40 tokens of isolated words were arranged on slides with a word per slide. The words were written in boldface upper case in black and size 166-point. Like in the picture-naming task, the slides were printed and arranged on flip charts and were flipped over in approximately three seconds. The participants were required to read what was on the slides in 5 minutes while they were being individually recorded using a Sony digital audio recorder.

4.7 Intervention

The same procedure used for grouping the participants during the pilot study using balloting was used for participant grouping into the three experimental condition groups (see section 4.3.2). They were given instruction using three different methods (listening + orthography, listening only and the traditional teaching method) as in the pilot study in 20 minute lessons in eight classes over the period of four school weeks. The instruction procedure and materials from the pilot study instruction were maintained. The only change to the pilot study as mentioned in section 4.3.6 was with the use of flip charts instead of Power Points slides for only the listening + orthography group instruction instead of using the laptop as originally intended.

4.7.1 Instruction lessons

The procedure for the intervention instruction was designed to assist the learners in improving their production and perception of consonant clusters, digraphs in clusters, and digraph singletons, also to cease their erroneous production and perception of silent singletons. In order to achieve this, materials for the teaching of these were designed to be taught in a 20-minute lesson per group in eight lessons, i.e. two lessons per week for each of the three experimental condition groups. The tape scripts of the lessons were recorded on a SONY digital audio recorder by a male British English native speaker. A KNSTAR band radio was used to play the sound files from a flash drive. The recordings were for the listening + orthography group and the listening only. Eight lessons were taught over four weeks of teaching. Each group had two contacts per week in which these were taught as shown in Table 4.7:

Table 4.7 Intervention instruction weekly lessons

Teaching week	Lesson	Topic
Week 1	Lesson 1	Two-consonant onsets: Cl, Cr, Cn (Consonant + /l/, /r/, /n/)
	Lesson 2	Three-consonant onsets: sCC (/s/ + 2 other Consonants)
Week 2	Lesson 3	Two-consonant codas: Ct, Cd, Cp, Ck (Consonant + /t/, /d/, /p/,/k/)
	Lesson 4	Three-consonant codas: /mpt/, /nts/, /mps/, /kst/
Week 3	Lesson 5	Initial silent singletons: k_, w_, p_, g_, h_, l_,
	Lesson 6	Mid/final silent singletons: _t_, _g_, _h_, _b_, _b, _n
Week 4	Lesson 7	Initial and final digraphs singletons: /ch/, /ph/, /sc/, /sh/, /gh/
	Lesson 8	Digraphs in clusters: C + ch, C+ ge, C + ph, C + th, CC + th

(See full lesson materials in Appendix D)

Upon completion of the four weeks of instruction, the participants repeated the four tasks that were administered during the pre-test in a post-test. This was done in order to measure the effect of the intervention instructions and to check whether there was difference in their performance between pre-test and post-test. Most crucially, it was to test the hypotheses of the study. The results of the pre-test and post-test were then analyzed and the procedure for doing that is described in section 4.8.

4.7.2 Daily classroom activity check

Learning objectives and outcomes were set for each lesson. It was very important for the research assistants who were teaching met the objectives for each lesson for each experimental

condition group. In order to check this, a daily classroom activity questionnaire was designed for the research assistants. This document comprises 15, 16 and 14 questions for listening + orthography group, listening only group and traditional teaching method group respectively. The questions in the questionnaire were divided into three sections as follows:

Section A: Preparation
Section B: Participation
Section C: Evaluation

The research assistants were required to honestly answer yes or no to the questions and give further explanation and comments wherever it was required (see Appendix Y for completed daily classroom activity checklists).

4.7.3 Research assistants

As mentioned earlier in section 4.3, the security challenges in northeast Nigeria caused by the Boko Haram insurgency could not allow the main researcher to go personally for the data collection. As a result, the main researcher trained two research assistants to conduct the data collection on her behalf. They were carefully trained not to differ in their instruction. The research assistants are both graduates of English from Nigerian Universities and they were teaching English language in the secondary school in Gombe state, Nigeria. The training was conducted during the main researcher's holiday in Nigeria. The research assistants were required to practice what they were trained upon, that is, they piloted the procedure. The main researcher sought permission to conduct the training and pilot study from the principal of Government Day Secondary School Zambuk, where the two research assistants work as English Language teachers (see Appendix T for the permission letter). The research assistants were required to give their consent for helping with the data collection and also to sign the confidentiality declaration and confirmation of ownership of data.

4.7.3.1 Consent

Each of the research assistants gave a letter of consent in which they acknowledged being approached by the main researcher in order to help with the data collection for the study in JSS Difa and Zambuk. They acknowledged that they had been trained and had practiced the procedure. Also, they acknowledged that they had agreed to serve as research assistants for the study (see Appendix S for the research assistants' letter of consent).

4.7.3.2 Confidentiality declaration

Having access to the study participants and data required the research assistants to declare that they understood that the access was provided to them on confidential basis. As a result, they were provided with the confidentiality declaration form. They declared that they would treat any information regarding the data collection including the participants and materials with total confidentiality. Also, that they would maintain anonymity of participants and not discuss their data with them (see signed confidentiality declaration in Appendix U).

4.7.3.3 Confirmation of ownership

Upon completion of the study, the research assistants declared and confirmed that the main researcher trained them as research assistants to help with the data collection on her behalf. They confirmed that they had sent all the materials used for the data collection and kept a copy in a pass worded flash drive with the principal of JSS Zambuk in a locked cabinet. Most importantly, they confirmed that the main researcher has full ownership and rights of the data (see Appendix V for signed confirmation of ownership).

4.8 Data analysis procedure

4.8.1 Method of data analysis

The OQPT was marked by the main researcher using a marking scheme provided. The OQPT part A consisted of 40 questions. One mark was given for each correct answer and the total of marks was used to determine the proficiency level of the learners based on the possible scores outlined in Table 4.3. The epenthesis task was also marked using a marking scheme prepared by the main researcher. One mark was given for each correct option of either A or B that matches with X. As for the dictation task, one mark was given for each correct spelling of the tests stimuli. Because the hypotheses of the study focus on the realization of consonant clusters, digraphs in clusters, silent singletons and digraph singletons only these tokens were considered. For the production tests in picture-naming and reading aloud tasks, learners' sound files were run through Praat speech analysis software and correct productions were calculated using the main researcher's judgement as correct pronunciation of the target stimuli. Like in the dictation task, marks were given for correct production of the target stimuli if there were no errors due to epenthesis, deletion, substitution, metathesis, orthographic production or loanword-induced transfer.

On completion of this, two other non-native English speakers vetted the production test marking in the form of spot-check marking to confirm the reliability and validity of the main researcher's judgement. This is presented in detail below. Additionally, a descriptive analysis was conducted to explain errors using linear phonological operations and rules. Finally, the data was analysed numerically and reported statistically using SPSS repeated measures ANOVA to check if there was significant improvement, group interaction and effect size between pre-test and post-test in the four tasks by the effect of instruction and proficiency levels. Also, Pearson's *r* correlation analysis was conducted to check if there was a significant relationship between production and perception.

4.8.2 Spot-check judgement

After listening to the productions of all the participants and giving marks for their correctness based on the main researcher's judgement, 20 production sound files were randomly selected from the pre-test and post-test to be judged and marked by two other non-native speakers. The rationale for using NNSs instead of English NS is because the production tests were not checking for native-likeness but for correctness as per the focus of the study. The sound files consisted of 10 samples of pre-test and 10 samples of post-test for both picture-naming and reading aloud task. The spot-check marking was done by a female Russian L2 phonology acquisition PhD student and a female Iraqi Arabic phonetics and phonology PhD student. Where there was difference of up to five marks between the three markers, the sound file judgement of that particular participant was re-examined by the marker whose marks were different from the other two markers. Upon completion of the spot-check marking, in the light of the few minor disagreements between the main researcher's marks of the other two markers, the main researcher went back and checked the entire data of all the 73 participants. The summary of the total spot-check marks for the 20 participants by the three markers is presented in Table 4.8 and Table 4.9 for pre-test and post-test respectively. The codes for the markers are as follows:

A. Marker 1: (T) Tera
B. Marker 2: (R) Russian
C. Marker 3: (A) Arabic

Table 4.8 Pre-test spot-check marks

Participant entry code	Marker 1 (T)		Marker 2 (R)		Marker 3 (A)	
	Picture-naming	Reading	Picture-naming	Reading	Picture-naming	Reading
Participant 4	22/40	24/40	22/40	22/40	22/40	21/40
Participant 9	23/40	26/40	22/40	27/40	22/40	28/40
Participant 10	16/40	11/40	16/40	11/40	16/40	10/40
Participant 13	22/40	34/40	23/40	36/40	22/40	36/40
Participant 34	25/40	31/40	26/40	32/40	27/40	33/40
Participant 36	14/40	18/40	15/40	18/40	13/40	17/40
Participant 38	19/40	32/40	20/40	32/40	20/40	32/40
Participant 49	9/40	21/40	10/40	22/40	9/40	22/40
Participant 69	14/40	26/40	14/40	25/40	14/40	28/40
Participant 73	15/40	26/40	15/40	26/40	15/40	23/40

Table 4.9 Post-test spot-check marks

Participant code	Marker 1 (T)		Marker 2 (R)		Marker 3 (A)	
	Picture-naming	Reading	Picture-naming	Reading	Picture-naming	Reading
Participant 6	19/40	9/40	19/40	10/40	17/40	9/40
Participant 8	17/40	7/40	18/40	7/40	17/40	7/40
Participant 13	28/40	36/40	26/40	34/40	27/40	36/40
Participant 26	23/40	7/40	22/40	6/40	22/40	7/40
Participant 31	29/40	33/40	28/40	32/40	30/40	34/40
Participant 43	26/40	15/40	25/40	14/40	22/40	15/40
Participant 49	13/40	26/40	15/40	25/40	15/40	26/40
Participant 51	25/40	35/40	26/40	36/40	26/40	35/40
Participant 61	25/40	34/40	24/40	32/40	24/40	35/40
Participant 73	22/40	30/40	23/40	30/40	23/40	30/40

(See Appendix E.1 and E.2 for the complete pre-test and post-test spot-check marks of these participants in the nine categories of test token types.)

4.8.3 Participant debriefing

Debriefing of participants and gatekeepers was done at the final stage of the research. This marked the completion of the study. The document reiterated the same details as on the information sheet. It gave information on the progress that the study had achieved and also stated the importance of the study that the findings could inform the most effective ways of oral English instruction and also draw recommendations for improvement. The document included information on how the data would be analyzed using statistical and sound analysis software. The rationale for using different methods for teaching the three experimental condition groups was also explained in the document. The information of the researcher and supervisors were provided on this document, in case the participants or gatekeepers would like to contact them

with queries or feedback regarding the study. Finally, as a gesture and in appreciation for participation, the 73 participants were each given educational materials consisting of two exercise books and a pen (see English, Tera and Hausa versions of the debriefing document in Appendix N.4, O.3 and P.3 respectively).

4.9 Chapter summary

This chapter shed more light on the issues in the L2 English Phonology of L1 Tera speakers looking at difficulties learners face due to L1 influence, non-correspondence of the phonology and orthography of English, and the method of teaching which the learners have been exposed to. The focus and motivation for the study were discussed and the hypotheses were also presented. This chapter also shows the results of the pilot study and observations made from the pilot study which helped in improving the methodology for the main data collection. In addition, the methodological approach and justification for choosing the participants' sample was given. Issues regarding ethics were also presented since the study required recruiting participants under the age of 18 from a non-English speaking country. Ethical issues discussed include information regarding the study, participant consent, risk assessment, and debriefing. Furthermore, the methodology for the main data collection and details of the experiments were presented. This covered information about participants, stimuli, procedure, intervention procedure, and method of data analysis. The chapter ended with the discussion on research assistants covering their consent, confidentiality declaration and confirmation of ownership of data. Next is the presentation of the results of the qualitative and quantitative analyses in Chapter Five.

Chapter 5: Results

5.1 Introduction

In this chapter, the results from the different production and perception tasks conducted in order to support the hypotheses of the study are presented. The chapter is divided into five sections. In section 5.1, the qualitative analysis of the production and perception tests by error category and by group is presented. Section 5.3 consists of the quantitative analysis results by the instruction method used for the three experimental condition groups in the course of the four weeks intervention. This is followed by the results by learners' proficiency levels in section 5.4. The next section 5.5 is the correlation results of the production and perception tests which also includes overall production and perception mean scores at pre-test and post-test by experimental condition group and proficiency level. Explanation on the support for the hypotheses of the study is provided in section 5.6. For ease of reference, each hypothesis will be presented at the beginning of the relevant section.

5.2 Production and perception error categories

Recall the discussion in Chapter Two that the errors that language learners make can be attributed to transfer from the L1 (Major 2008). For Tera/Hausa learners, this transfer could be influenced by the fact that the writing system of Tera/Hausa (like Italian) is regular and transparent unlike that of English (Bassetti 2008). So, the learners tend to pronounce them as they are spelled. Another factor is the differences in the syllable structures of Tera, Hausa and English. English allows complex onsets and codas whereas Tera and Hausa only C onset and coda. Based on loan words, this is expected to result in Tera learners' epenthesis of a vowel to simplify these syllables. These factors inform the assumption that Tera learners of L2 English will not correctly produce and perceive L2 English silent singletons or consonant clusters.

In this section, the errors made by the learners in the production test and the perception on the nine token types are described. The errors are grouped into categories and examples from the learners errors are illustrated using linear phonological operations and rules (cf. Davenport and Hannahs 2010) in sections 5.2.1 and 5.2.2 (see appendix G for complete list of picture-naming, reading aloud and dictation errors, appendix F for the description of the phonological features used in the analyses and appendix H for the feature specification tables for consonants and vowels). Importantly, the variation in errors on both production and perception tests are across speakers. The errors made in each category are also quantified by experimental condition

groups and proficiency levels. The percentages of the errors made in pre-test and post-test are presented showing the percentage of the reduction in errors made by the groups on each category between time '1' and time '2'.

5.2.1 Production test error categories

Overall, the pronunciation errors made by the learners in the production tests in reading aloud tasks and picture-naming were as predicted in **H1.3** and **H1.4** which states in **H1.3** that experimental learners will exhibit better production of grapheme-phoneme correspondences due to the availability of orthography in the monitored oral reading production task. While in **H1.4** experimental learners will improve in producing the test stimuli when presented with their pictures in the picture-naming task. The errors show that they incorrectly produced consonant clusters e.g. in <clock>, <straw>, and <desk>, digraphs in clusters e.g. <bench>, <fridge>, and <syringe>, silent singletons e.g. <knife>, <signboard>, and <whistle> and digraph singletons e.g. <phone>, <duck>, and <ring>. The error categories were vowel epenthesis, consonant cluster reduction, phone substitution, metathesis, orthography-based production, and loanword transfer production (see appendix G.2 for a complete list of production errors by the learners). [23] [24] As earlier mentioned, these errors are described using linear phonological operations and rules. In addition, the overall errors are calculated based on these categories. Percentages of errors made are presented in tables according to experimental condition groups and proficiency level at pre-test and at post-test. In the following sub-sections, errors on the oral elicited production in picture-naming are presented first followed by reading aloud errors.

5.2.1.1 Picture-naming task errors

The errors made by the learners in the picture-naming task are illustrated in this section. Firstly, the percentage of errors is presented followed by the qualitative analyses of the different error categories. The overall percentage of errors made by the different groups was calculated based on the error categories. This was done by adding up the total number of errors made and dividing it by the total number of stimuli times the total number of participants in each

[23] Certain number of words were not produced by the learners in English. These words were produced with their Tera/Hausa name and were therefore discounted from these analyses. For instance *clock* → agogo [aɡógó], *spring* → waya [waja], *orange* → lemu [lemú], *syringe* → alura [àlurà]

[24] Recall as mentioned in Chapter Four section 4.6.1, English loanwords were included in the test tokens because of the need to use words that the learners actually knew and because the words contained consonant clusters or digraphs.

experimental condition group and proficiency level.[25] This procedure was followed for each error category in both pre-test and post-test and then converted to a percentage. The percentages of errors made are presented according to experimental condition groups and proficiency level in Table 5.1 and Table 5.2 respectively. Quantification of these data provides a nuanced picture of how errors changed in response to the three different experimental conditions. For all groups, the rate of error dropped between pre- and post-test. The boxes of the group with the largest changes are highlighted.

Table 5.1 Pre-test and post-test percentage errors on the picture-naming task by experimental condition

Error categories	**Experimental condition groups**					
	TTM		**LIST + ORTH**		**LIST**	
	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
Vowel epenthesis	47.9%	37.9%	59.9%	43.6%	51.6%	42.0%
% difference	10%		16.3%		9.6%	
Consonant/digraph cluster reduction	63.5%	56.3%	57.7%	37.2%	64.9%	60.2%
% difference	7.2%		20.5%		4.7%	
Phone substitution	53.4%	46.6%	45.5%	31.1%	54.2%	40.1%
% difference	6.8%		14.4%		14.1%	
Orthographic production	57.2%	40.9%	63.5%	41.1%	60.9%	43.5%
% difference	16.3%		22.4%		17.4%	
Metathesis	56.8%	43.2%	74.2%	60.0%	70.4%	69.6%
% difference	13.6%		14.2%		0.8%	
Loanword transfer production	82.7%	66.2%	67.6%	46.8%	59.6%	48.4%
% difference	16.5%		20.8%		11.2%	

The percentages of the production errors in the picture-naming task by the effect of instruction in Table 5.1 show a reduced error rate by all the groups on the picture-naming task with the listening + orthography group having greater reduction in errors in all the error categories. This suggests that explicit orthographic input during instruction has an effect, supporting **H2.1** which states that experimental learners will reduce their error rates in the categories of errors.

[25] As a reminder, the abbreviation for the experimental condition groups are as follows:

- LIST + ORTH – Listening + orthography group
- LIST – Listening only group
- TTM – Traditional teaching method group

Table 5.2 Pre-test and post-test percentage errors on the picture-naming task by proficiency level

Error categories	Proficiency levels					
	Beginner-level		Breakthrough-level		Elementary-level	
	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
Vowel epenthesis	59.3%	47.1%	56.6%	43.4%	47.2%	31.7%
% difference	12.2%		13.2%		15.5%	
Consonant/digraph cluster reduction	63.3%	47.1%	64.8%	52.3%	56.3%	43.0%
% difference	16.2%		13.5%		13.3%	
Phone substitution	57.0%	45.2%	48.6%	37.5%	85.2%	58.5%
% difference	11.8%		11.1%		26.7%	
Orthographic production	50.7%	33.8%	64.6%	45.7%	46.3%	30.7%
% difference	16.9%		18.9%		15.6%	
Metathesis	63.4%	47.1%	77.6%	67.8%	58.7%	50.7%
% difference	16.3%		9.8%		8%	
Loanword transfer production	74.9%	64.7%	72.7%	60.0%	58.7%	44.0%
% difference	10.2%		12.7%		14.7%	

The percentages provided by proficiency level in Table 5.2 show a distributed improvement by the proficiency levels on the picture-naming task. The beginner-level learners were better in reducing their errors in consonant/digraph cluster reduction, metathesis and loanword transfer production, whereas the elementary-level learners were better in reducing errors in vowel epenthesis, phone substitution and vernacular transfer production. The breakthrough-level learners improved better on only orthographic production. The percentages of scores by proficiency level only partially support the prediction in **H2.2** which states that there will be difference in error rates of learners whose proficiency level is higher. As seen in Table 5.2, beginner-level learners (lower proficiency level based on OQPT scores) improved equally to the elementary-level learners. Therefore, proficiency level only partially showed a difference in error rate reduction by learners with higher proficiency levels.

In the subsequent sub-sections, the errors categories are described using phonological operations and rules.

5.2.1.1.1 Vowel epenthesis

The learners inserted vowels [u] [o] [ɪ] to simplify clusters not allowed in Tera/Hausa. The quality of the epenthetic vowels was systematic as they shared the same features in either height, frontness or roundness with the lexical vowels within the words in the test stimuli. This is a phonotactic process of vowel harmony. Nevins (2010) describes vowel harmony as a set of restrictions that determines the permissible sequences of possible and impossible vowels within a word. For instance in Turkish, front vowels /i, ü, e ö/ are forbidden from mixing with back vowels /ı, u, a, o/ in the same word if the word is to be considered 'harmonic' and this restriction

is maintained even when suffixes pile up to the word. For example, Yoruba, a Niger-Congo language spoken in Nigeria (but not related to Tera or Hausa which are Chadic languages), determines the localization of vowel harmony by the closest vowel harmony for tense vs lax for any vowel when considering which vowel is next. For example /ɔ/ cannot precede /u/ in a word, for instance in *orúkɔ* 'name' and *èlùbɔ* 'yam flour' (see Nevins 2010, Krämer 2003, Archangeli and Pulleyblank 1989).

There is no research done on Tera vowel harmony. Tench (2007a) briefly mentions vowel harmony in his description of Tera vowels and states that based on examination of the sequences of vowels within words, there is no vowel harmony in Tera. In addition, while describing the vowel systems of Chadic languages, Newman (2009:620) also briefly mentions it and states that "cross-height vowel harmony of the common West African type is rare in Chadic but it does occur". Hence, going by Krämer's (2003:3) definition of vowel harmony as "a phenomenon where potentially all vowels in adjacent moras or syllables within a domain like the phonological or morphological word (or a smaller morphological domain) systematically agree with each other with regard to one or more articulatory feature"; then it could be said that there is 'probably' vowel harmony in Tera.[26]In the disyllabic words shown in (5.1), the vowels in the morphological words agree in terms of one or more features.

(5.1) Tera probable vowel harmony in disyllabic words

a) guno /guno/ 'goat'
b) meeni /meːni/ 'today'
c) fuda /fɨɗa/ 'sun'

In (5.1) item (a), the vowels [u] and [o] are [-front, +round], while in item (b), [e:] and [i] are [+front, - round] same as [ɨ] and [a] in item (c).

Table 5.3 shows the distinctive features of the epenthetic vowels used by the learners according to the feature specifications for vowels. The epenthesis rule in (5.2) gives a description of some examples from the learners' production in the picture-naming task.

[26] This is a claim based on the main researcher's intuition as a native speaker of Tera in respect of her understanding of the process of vowel harmony as described in Krämer (2003). The case of vowel harmony in Tera is a study on its own which is beyond the scope of this thesis. More evidence and in-depth research in needed for this phenomenon.

Table 5.3 Distinctive features of the epenthetic vowels

	u	**o**	**ɪ**	**e**
High	+	-	+	-
Back	+	+	-	-
Front	-	-	+	+
Round	+	+	-	-

Epenthesis

(5.2) Ø → V[α back, β front, α round][27] / C _____ C V[α back, β front, α round]

[-cont] [+son]

(5.3) Vowel epenthesis in picture-naming (1)

'clock' /klɒk/ →[k**u**lok, k**o**lok[28]]

'block' /blɒk/ →[b**u**lok]

'drum' /drʌm/ →[d**u**rom]

(5.4) Ø → V[-back, +front, -round] / C C _____#

[+son, +sib]

(5.5) Vowel epenthesis in picture-naming (2)

'bench' /benʧ/ was pronounced [benʧ**ɪ**]

'syringe'/sɪrɪnʤ/ was pronounced [sɪrɪnʤ**ɪ**]

'spring' /sprɪŋ/ was pronounced [sp**ɪ**rɪŋ]

The rule in (5.2) shows that a null segment (represented with a zero with stroke Ø) is filled by inserting a vowel segment (note that α and β refer to features that can be independent without affecting other features, i.e. either '+' or '-') in the environment between a cluster of [-cont] and [+son] consonants in the words in (5.3) and in (5.4) at the end of a word after a cluster with segments [+son] and [+sib] in the words in (5.5). The epenthetic vowels (in boldface) used by the learners in their production in the words on the right share the same features with the corresponding lexical vowels in the words of the test stimuli on the left. Krämer (ibid) categorizes this type of vowel harmony as '*feature combinations*'.

5.2.1.1.2 Cluster reduction

For consonant cluster reduction e.g. in the words, *plants*, *ants*, *hands* and digraph in cluster reduction e.g. in *orange*, *syringe*, and *bench*, a consonant gets deleted and the learners produced the stimuli without that consonant. These are illustrated in the following words from the learners'

[27] The description of the phonological features are provided in the appendix

[28] Two or more examples of production of a stimulus are variations across speakers.

elicited oral production of *lamps, hands, syringe* and *bench* in (5.6) for consonant clusters and (5.7) for digraphs in clusters.

(5.6) Consonant cluster reduction

a) 'lamps'

[p] omission in /læmps/ → [læms]

b) 'hands'

[d] omission in /hænds/ → [hæns]

(5.7) Digraphs in cluster reduction

a) 'syringe'

[ʤ] omission in /sɪrɪnʤ/ → [sɪrɪn]

b) 'bench'

[ʧ] omission in /benʧ/ → [ben]

5.2.1.1.3 Phone substitution

This is the case of changing a phoneme to another one which shares some phonological features but differs in either place or manner features as shown in the sample of the learners' production in (5.8).

(5.8) Phone substitution in picture-naming

a) [+ nas, - cor, + back] → [+ nas, +cor, - back] / ____#

/ŋ/ → [n] in 'ring' /rɪŋ/ → [rɪn]

b) [-son, +pal, +voi] → [-son, +pal, -voi] / ____#

/ʤ/ → [ʧ] in 'syringe' /sɪrɪnʤ/ → [sɪrɪnʧ]

c) [+ cont, -son, - voi] → [- cont, - son - voi] / ____ #

/θ/ → [t] in 'teeth' /tiːθ/ → [tiːt]

d) [+cons, -syll, +stri] → [+cons, -syll, -stri] / #____

/f/ → [p] of [h] in 'phone' /fəʊn/ → [pon] or [hon]

The examples in (5.8) show the types of substitution errors that the learners made in the picture-naming task. The segments substituted in example (a) differ in place features. In the production of *ring* /rɪŋ/, the non-coronal back phoneme /ŋ/ was substituted to a coronal non-back phoneme /n/. On the other hand, there were differences in manner features in the substituted phonemes in examples (b), (c) and (d). The voiced palatal phoneme /ʤ/ in *syringe* /sɪrɪnʤ/ was substituted to the voiceless palatal phoneme /ʧ/ in example (b). In the production of *teeth* /tiːθ/ in example (c), the continuant phoneme [θ] was substituted to a non-continuant phoneme /t/, where as in

example (d), the strident phoneme /f/ in *phone* /fəʊn/ was substituted to non-strident phonemes /p/ or /h/ (see appendix F for description of the phonological features).

5.2.1.1.4 Metathesis

There were instances of metathesis, the reordering of the sequence of segments (O'Grady, Dobrovolsky & Katamba 1996) thereby leading to incorrect pronunciations. According to Kløve and Young-Scholten (2001), just as L2 learners use deletion and epenthesis as a repair strategy in L2 syllable structures, metathesis is another strategy used by L2 learners, typically when faced with syllables that constitute universal principle violations and L1-specific constraints. Davenport and Hannahs (Ibid) follow the practice of using an abstract representation of assigning numbers (called indices) to the metathesized segments involved. For instance, in the learners' production of *desk*, the two coda consonants were reordered thereby resulting in the reversed order of the segments. The metathesis rule in (5.9) illustrates this.

(5.9) Metathesis

$C_1V_2C_3C_4 \rightarrow 1243$

(5.10) Metathesis in picture-naming

/desk/

/d_1 e_2 s_3 k_4/ → [d_1 e_2 k_4 s_3]

The rule in (5.9) shows the segments of consonants and vowels with the index. In (5.10), the word in the example is indexed to show the reversal of the metathesized order in the output on the right. In the example, the /sk/ indexed as 3 and 4 becomes [ks] 4 and 3 thereby changing /desk/ to [de**ks**].

5.2.1.1.5 Orthographic production

The results show the opposite of how the learners performed in the perception test as we will later see in the dictation task errors. In the production task, silent singletons were mostly produced, whereas in the dictation task, they omitted them and simply wrote the words as they heard them being produced on the audio player without the silent singletons. Production of silent letters is what Bassetti and Atkinson (2015) refer to as a case of '*orthography-induced-epenthesis'* where a sound is added which has a graphemic value but no phonological correspondence. This concurs with previous research which reports that when orthographic forms are present, the effects in production are greater (e.g. Young-Scholten and Hannahs 1997,

Young-Scholten 2002, Rafat 2011, Bassetti, Escudero and Hayes-Harb 2015, Bassetti and Atkinson 2015). This is illustrated in (5.11) of the learners' production of *wristwatch* and *whistle* in which a segment that has no acoustic value is added in the learners' production and also involves epenthesis.

(5.11) Orthographic production in picture-naming

a) <w> in 'wristwatch' /ɹɪstwɒʧ/ → [**wu**riswoʧ]

b) <t> in 'whistle' /wɪsl/ → [wɪs**t**il]

5.2.1.1.6 Loanword production

In this category, the participants produced the stimuli based on knowledge of the common way of producing the words borrowed from English to Hausa to Tera as illustrated in (5.12).

(5.12) Loanword production in picture-naming

a) 'screwdriver' /skruːdraɪvə/ was pronounced [skuːldraɪvə]

b) 'tank' /tæŋk/ was pronounced [taŋki]

c) 'table' /teɪbl/ was pronounced [tebur]

d) 'whistle' /wɪsl/ was pronounced [wusɪr]

In (5.12) example (a), the word *screwdriver* as a loanword is spelled <sukudireba> in Hausa. However, the learners produced it as [skuːldraɪvə] and also spelled <schooldriver> as we will later see in the dictation written production task. Interestingly, this is how the word has been commonly produced by many Hausa speakers in northern Nigeria. On the other hand, the words in (b) to (d) show that there was vowel epenthesis in the production of the loanwords. This conforms to what was discussed in previous chapters that Hausa speakers usually insert a vowel or delete a consonant in loanwords to make the syllable structure conform to their L1 syllable structures, which disallow CC structures.

5.2.1.2 Reading production errors

Errors made in the monitored production on the reading aloud task were in the same categories as the picture-naming tasks. In the reading aloud task, the learners seem to have made more effort in producing the stimuli considering that they were presented with the written word. The data show the effect of reading when compared to the picture elicitation data. The same rules used for the picture-naming task error types also apply to the reading aloud task data. Percentage of reading errors are presented first by experimental condition groups and then by proficiency level.

Table 5.4 Pre-test and post-test percentage errors on the reading aloud task by experimental group

Error categories	Experimental condition groups					
	TTM		LIST + ORTH		LIST	
	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
Vowel epenthesis	42.6%	36.4%	40.6%	24.2%	46.1%	36.8%
% difference	6.2%		16.4%		9.3%	
Consonant/digraph cluster reduction	52.4%	43.4%	47.0%	28.5%	54.4%	46.7%
% difference	9%		18.5%		7.7%	
Phone substitution	43.2%	36.1%	37.7%	23.4%	46.6%	39.1%
% difference	7.1%		14.2%		7.5%	
Orthographic production	56.7%	45.5%	67.2%	42.2%	58.3%	52.2%
% difference	11.2%		25%		6.1%	
Metathesis	43.1%	36.9%	47.7%	35.6%	50.2%	44.0%
% difference	6.2%		12.1%		6.2%	
Loanword transfer production	55.0%	48.5%	47.9%	29.2%	58.3%	48.3%
% difference	6.5%		18.7%		10%	

Here also we see an overall reduced error rate by all the experimental condition groups between time ‘1’ and time ‘2’. The listening + orthography group showed a greater reduction of errors on the reading aloud monitored task in all the error categories than the traditional teaching method group and the listening-only group. The percentages in Table 5.4 show the effect of orthographic input on the listening + orthography group in their monitored production. These results support **H2.1** which predicts better error reduction by the experimental learners.

InTable 5.5, the beginner-level learners had lower error rates on all the categories except on loan word production which the breakthrough-level learners had better reduced error rates. The reading aloud task percentage scores do not support the prediction in **H2.2** which states that the error rates of learners whose proficiency level is higher will be lower. On the contrary, the beginner-level learners (lower proficiency based on OQPT scores) had lower error rates, which shows that they improved more than the elementary-level learners.

Table 5.5 Pre-test and post-test percentage errors on the reading aloud task by proficiency level

Error categories	Proficiency levels					
	Beginner-level		Breakthrough-level		Elementary-level	
	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
Vowel epenthesis	56.9%	43.7%	46.7%	36.6%	33.3%	26.3%
% difference	13.2%		10.1%		7%	
Consonant/digraph cluster reduction	56.4%	40.5%	50.7%	41.7%	36.3%	25.9%
% difference	15.9%		9%		10.4%	
Phone substitution	50.7%	37.6%	45.2%	34.5%	27.2%	22.6%
% difference	13.1%		10.7%		4.6%	
Orthographic production	68.6%	51.5%	58.7%	47.4%	43.9%	31.1%
% difference	17.1%		11.3%		12.8%	
Metathesis	58.2%	45.8%	48.8%	42.0%	32.0%	26.7%
% difference	12.4%		6.8%%		5.3%	
Loanword transfer production	56.9%	45.5%	54.1%	42.2%	41.3%	33.3%
% difference	11.4%		11.9%		8%	

The categories of errors are described in the following sub-sections.

5.2.1.2.1 Vowel epenthesis

The same vowels [u] [o] [ɪ] as in the picture-naming task were inserted to simplify consonant clusters by the learners in the reading aloud task. Examples from the learners' production include:

(5.13) Vowel epenthesis in consonant cluster in reading aloud

$$\text{Ø} \rightarrow \text{V}[\alpha \text{ back}, \beta \text{ front}, \alpha \text{ round}] \,/\, \text{C} \underset{[\text{-cont}]}{\_\_\_\_\_} \underset{[\text{+son}]}{\text{C}} \ \text{V}[\alpha \text{ back}, \beta \text{ front}, \alpha \text{ round}]$$

a) 'brush' /bɹʌʃ/ → [b**u**roʃ]

b) 'snake' /sneɪk/ → [s**ɪ**nek]

c) 'spring' /spɹɪŋ/ → [sp**ɪ**rɪŋ], s**ɪ**p**ɪ**rɪŋ]

(5.14) Vowel epenthesis in digraphs in clusters in reading aloud

$$\text{Ø} \rightarrow \text{V}[\text{-back}, \text{+front}, \text{-round}] \,/\, \text{C} \ \underset{[\text{+son, +sib}]}{\text{C}} \_\_\_\_\_\#$$

a) 'bench' /benʧ/ → [benʧ**ɪ]**

b) 'syringe' /sɪrɪnʤ/ → [sɪrɪnʤ**ɪ]**

The epenthetic rules in (5.13) and (5.14) are similar to the ones in the picture-naming vowel epenthesis error category described in section 5.2.1.1.1.

5.2.1.2.2 Cluster reduction

The same type of errors in cluster reduction on the picture-naming elicitation were also made in the reading aloud task. The learners deleted consonants from the stimuli and produced the words without the consonants. Examples include:

(5.15) Consonant cluster reduction in reading aloud

a) 'straw'
   [r] omission in /stɹɔː/ → [stɔː]
b) 'fence'
   [s] omission in /fɛns/ → [fen]
c) 'desk'
   [k] omission in /desk/ → [des]

5.2.1.2.3 Phone substitution

Just like in the picture-naming task, there was substitution of phonemes on the reading aloud production task. The substitution of a phone with either difference in place features or manner features is illustrated in the following examples:

(5.16) Phone substitution in reading aloud

a) [+ cor, - voi, - pal] → [+ cor, - voi, + pal] / ____ #
   /s/ → [ʧ] in 'fence' /fɛns/ → [fenʧ]
b) [-son, +pal, +voi] → [-son, +pal, -voi] / ____#
   /ʤ/ → [ʧ] in 'fridge' /fɹɪʤ/ → [fɹɪʧ]

The segment substituted in (5.16) example (a) differ in place features. In the production of *fence* /fɛns/, the non-palatal phoneme /s/ was substituted to the palatal /ʧ/. In example (b), the substituted segment differs in manner features with the voiced palatal phoneme /ʤ/ was substituted with a voiceless one /ʧ/.

5.2.1.2.4 Metathesis

Aside from the metathesis of *desk* presented in the picture-naming task which was also repeated in the reading aloud task, there was also metathesis of 'signboard'. In this case, the metathesis was done underlyingly, that is, they visualized the spelling in their mind, and when they read the stimuli, they produced the initial syllable of the word as *sing* /sɪŋ/ which is also an English word.

(5.17) ‘signboard’

/saɪnbɔːd/ → [sɪŋbɔːd]

5.2.1.2.5 Orthographic production

The reading aloud task revealed the effect of orthography in the learners’ production as they tried to produce the individual letters in the silent singleton stimuli. What is interesting here is the interaction of spelling and epenthesis. This could have occurred because they assumed that every letter represented a sound and needed to be pronounced. This was also triggered when a silent singleton was next to another consonant e.g. <**p**n> or <**g**n> and learners responded as if these were disallowed clusters in Tera/Hausa as shown in the examples in (5.18)

(5.18) Orthographic production in reading aloud

a) <p> in ‘pneumonia’ /njuːməʊniə/ → [**p**enɪmonɪa]
b) <k> in ‘knife’ /naɪf/ → [**k**inaɪf]
c) <g> in ‘signboard’ /saɪnbɔːd/ → [si**g**inbɔːd]

5.2.1.2.6 Loanword production

These were similar loanword productions like on the picture-naming task where, words were produced in the common way that the learners use them as loan words, or a vowel was inserted as a result of how loanwords were resolved in Hausa as shown in (5.19).

(5.19) Loanword production in reading aloud

‘bench’ /benʧ/ pronounced [benʧ**ɪ**].

5.2.2 Perception test error categories

Some interesting results from the dictation elicited written production task performance included spelling errors. These were errors resulting from not correctly perceiving the test tokens which resulted in the same error types as the ones made on the production task presented in the previous section. The difference was that in the perception tasks, the errors were made during writing rather than in speech production. As for the epenthesis perception task, errors were in the students’ choice of the wrong option between the stimuli in either A or B that matches with X as a result of not correctly perceiving the correct option (see section 4.3.5.1 for how the epenthesis task was conducted with samples in Table 4.6). Only the dictation task errors are described in this section. Like in the production task, the errors are grouped into error categories comprising the following: vowel epenthesis, deletion, substitution, metathesis,

orthographic influence and loanword spelling. The variation of errors in the dictation task examples like in the production tests are across speakers (see appendix G.1 for complete list of errors). In the following sub-sections, examples of the dictation error categories are described using linear representations of phonological operations and rules as used in the previous section. Overall percentage errors made on the dictation task were calculated using the same procedure used in section 5.2.1 to calculate the percentages of the dictation errors made in pre-test and post-test. These are presented according to the different experimental condition groups in Table 5.6 and proficiency level in Table 5.7.

Table 5.6 Pre-test and post-test percentage errors on the dictation task error categories by experimental group

Error categories	**Experimental condition groups**					
	TTM		**LIST + ORTH**		**LIST**	
	Pre-test	Post-test	Pre-test	Pre-test	Pre-test	Post-test
Vowel epenthesis	80.1%	64.9%	78.3%	60.3%	80.4%	71.7%
% difference	15.2%		18%		8.7%	
Deletion	84.3%	69.1%	82.2%	65.0%	87.4%	75.8%
% difference	15.2%		17.2%		11.6%	
Substitution	84%	72%	78.1%	60.5%	82.6%	73.9%
% difference	12%		17.6%		8.7%	
Orthographic influence	75.7%	60.3%	77.2%	61.3%	80.5%	70.4%
% difference	15.4%		15.9%		10.1%	
Metathesis	82.9%	71.4%	83.8%	67.6%	85.0%	80.7%
% difference	9.8%		16.2%		4.3%	
Loanword transfer spelling	85.0%	73.1%	84.6%	68.8%	87.8%	77.4%
% difference	11.9%		15.8%		10.4%	

Table 5.7 Pre-test and post-test percentage errors on the dictation task error categories by proficiency level

Error categories	**Proficiency levels**					
	Beginner-level		**Breakthrough-level**		**Elementary-level**	
	Pre-test	Post-test	Pre-test	Pre-test	Pre-test	Post-test
Vowel epenthesis	81.6%	70.6%	82.5%	69.1%	72.3%	54.7%
% difference	10%		13.4%		17.6%	
Deletion	87.7%	78.3%	84.1%	69.9%	74.2%	56.1%
% difference	9.4%		14.2%		18.1%	
Substitution	79.4%	69.5%	78.7%	65.3%	69.4%	53.0%
% difference	9.9%		13.4%		16.4%	
Orthographic influence	96.3%	85.3%	97.3%	84.8%	88.3%	66.7%
% difference	11%		12.5%		21.6%	
Metathesis	82.4%	68.2%	87.5%	73.8%	91.7%	75.0%
% difference	14.2%		13.7%		16.7%	
Loanword transfer spelling	88.2%	77.6%	86.6%	74.4%	80.7%	64.0%
% difference	10.6%		12.2%		16.7%	

Generally, there was a higher percentage of errors made by all the experimental condition groups and proficiency levels at pre-test and a reduced error rate at post-test. The percentages

in Table 5.6 show that the listening + orthography group reduced their errors more than both the traditional teaching method group and the listening-only group in all the error categories. These results support **H2.1** and show a reduced error rate for the listening + orthography group who received explicit orthographic instruction compared to the traditional teaching method and listening-only groups. The percentage of errors of the listening + orthography group and the traditional teaching method groups is however not very far apart compared to that of the listening-only group. The greater reduction in error rates of the listening + orthography group and the traditional teaching method group could have been influenced by the fact that they had orthographic input during instruction which led to their reduced spelling errors on the dictation task compared to the listening-only group who had no orthographic input at all.

On the error categories by proficiency level, the elementary-level learners had more reduced error rates on all the error categories as shown in Table 5.7. The highest variation in percentage between pre-test and post-test was on the orthographic influence category with a difference of 21.6%. These results support the prediction in **H2.2** and show that proficiency level played a role in the differences of error rates made by the learners between pre-test and post-test. As predicted, the elementary-level learners (higher level based on OQPT scores) had the highest variation on all the categories followed by the breakthrough-level learners and the beginner-level learners had the least.

5.2.1.1 Vowel epenthesis

The vowels [u], [o], [ɪ] or [e] were inserted between consonant clusters or after consonant/digraph clusters. These spellings were based on the learners' own productions (as seen in the production test errors in section 5.2.1). Like in the production test errors, there was vowel harmony in the vowels epenthesized by the learners. For the analysis, the same epenthesis rules in (5.2) and (5.4) apply for the perception test errors.

(5.20) Vowel epenthesis in consonant cluster in dictation written production (1)

$$\emptyset \rightarrow V\ [\alpha \text{ back}, \beta \text{ front}, \alpha \text{ round}] \ / \ C \underset{[-\text{cont}]}{\_\_\_\_\_} C \underset{[+\text{son}]}{\ } V\ [\alpha \text{ back}, \beta \text{ front}, \alpha \text{ round}]$$

a) 'clock' → <c**o**lock>, <c**o**lok>
b) 'block' → <b**u**lok>
c) 'drum' → <d**o**rom>, <d**u**rum>
d) 'straw' → <st**o**r>, <st**o**ro>
e) 'snake' → <s**e**nek>, <s**i**nek>
f) 'spring' → <s**e**pren>, <sp**i**ring>, <sp**e**ring>

(5.21) Vowel epenthesis in consonant cluster in dictation written production (2)

Ø → V [-back, +front, -round] / C C _____#
[+son] [+sib]

a) ‘fence’ → <fens**i**>,
b) ‘bench’ → <bench**i**> or <bench**e**>
c) ‘syringe’ → <sering**i**>
d) ‘church’ → <church**e**>, <church**i**>

Here, like in the production epenthesis error category, a null segment is filled by inserting a vowel segment in the environment in a cluster of [-cont] and [+son] consonants in the words in (5.20), and at the end of a word after a cluster with segments [+son] and [+sib] in the words in (5.21). The epenthetic vowels share the same features with the corresponding lexical vowels in the words. On the other hand, in (5.21) example (d) the epenthesis in *church* does not show that type of vowel harmony. What is interesting is that the word *church* as a loan word in Hausa is spelled <coci> and pronounced [ʧoʧɪ]. This could have influenced the Tera/Hausa speakers’ insertion of the vowel letters <i> or <e> following a consonant that ends with a sonorant followed by a sibilant. The vowel [i] also share the same features of [- back, + front, - round] with the vowel [e].

5.2.1.2 Deletion

There were instances where one or two consonants were deleted in consonant clusters or digraph clusters and the segments become null in the learners’ written production. The rule in (5.22) represents the loss of a segment in the words in the examples in (5.23) of the learners’ spelling in the dictation written production task. Note here that in example (b) *hands* spelled <hans>, the same way it was produced.

(5.22) Deletion

A → Ø / B ____ C

(5.23) Deletion in dictation written production

a) ‘straw’
   <r> → Ø / st___aw spelled <staw>
b) ‘hands’
   <d> → Ø / han___s spelled <hans>
c) ‘orange’
   <n> → Ø / ora___ge spelled <orage>

5.2.1.3 Substitution

Substitution occurred where digraph singletons and digraphs in clusters were replaced by either devoicing the voiced digraphs or voicing a voiceless digraph. In other instances, digraph singletons were substituted with single consonants. Using phonological features, examples of these substitutions in *teeth, duck* and *fridge* are described as follows:

(5.24) Substitution in dictation written production

a) [+cont, -son, -voi] → [-cont, -son -voi] / ____ #
   'teeth' → <teet>

b) [-cor, +back -voi] → [-cor, +back, +voi] / ____#
   'duck' → <dog>

c) [+pal, -son, +voi] → [+pal, -son, -voi] / ____#
   'fridge' → <frich>, <ferish>

The words in (5.24) capture the perception errors the learners made by substituting segments in coda positions. This resulted in the incorrect spelling of the words in the dictation written production task. Notice that in (b), as well as adding voicing to the voiceless digraph, the substitution was to a common word *dog*. Also in (c) there is also vowel epenthesis in <ferish>.

5.2.1.4 Metathesis

Like in the production tasks, some consonants were reordered in the learners' spelling in the dictation task thereby resulting in the repositioning of the segments in the words. Instances of metathesis are seen in the learners' written production in their spelling of *desk* and *signboard* which were also reordered in their oral production as earlier mentioned. The metathesis rule used in (5.9) is used to present the reordered segments in the written production of *hands* in (5.25).

(5.25) Metathesis in dictation written production

$C_1V_2C_3C_4C_5 \rightarrow 12354$

a) 'hands'

$<h_1\ a_2\ n_3\ d_4\ s_5> \rightarrow <h_1\ a_2\ n_3\ s_5\ d_4>$

(5.25) shows the segments of consonants and vowels indexed to show the reversal of the metathesized order in *hands* in which the <ds> segments indexed 4 and 5 becomes <sd> 5 and 4 resulting in changing *hands* to <han**sd**>. Note the metathesis in 'hands' was not found in the production data, (see previous section).

5.2.1.5 Orthographic influence

This is an instance of sound-to-spelling correspondence where the learners wrote the words as they heard them being spoken by the English native speaker as played on the audio player. This can be expressed in terms of loss of a grapheme in the spelling of the words as the learners listened and wrote as shown in the following examples

a) <k> in 'knife' spelled <nife> or <naif>
b) <k> in 'knitting' spelled <nitin> or <neten>
c) <p> in 'pneumonia' spelled <nimoniya> or <nimoniyer>
d) <h> in 'wheelbarrow' spelled <willbarrow> or <wilbiyiro>
e) <w> in 'wristwatch' spelled <ristworch>

Examples (a) to (e) above show the type of errors made by the learners. The letters <k> in *knife* and *knitting*, <p> in *pneumonia*, <h> in *wheelbarrow* and <w> in *wristwatch* that have graphemic value but no phonological correspondences in the words were omitted as they wrote those words during the dictation written production task. This is contrary to what they did in the production test where they produced the sounds represented by these letters.

5.2.1.6 Loanword transfer spelling

As explained previously that some instances of vowel epenthesis could be as a result of the way the loanwords are resolved in Tera/Hausa. Instances of such loanword spellings are shown in Example 5.26

Example 5.26 Loanword spelling in dictation written production

a) 'screwdriver' spelled <schooldriver>, <sucuderaver>, <skoldriver>
b) 'bench' spelled <benci>
c) 'tank' spelled <tanki>
d) 'church' spelled <coci>
e) 'syringe' spelled < sirinji>

5.2.3 Section summary

This section revealed the types of errors made by the learners in the elicited oral production in picture-naming task, reading aloud task and dictation elicited written production task showing the percentages of the errors made according to experimental condition group and proficiency level. The error categories show that the learners resolved consonant cluster difficulties by

either epenthesis of a vowel, deletion, substitution and metathesis as a repair strategy for the syllable structures or segments that are not present in the L1. Other errors made as a result of loanword transfer were also presented.

In the following sections, quantitative analyses results are presented beginning with the results of the experimental condition groups by the effect of instruction

5.3 Results by the effect of instruction and test token types

For the quantitative analysis, as a means of checking whether there was a statistically significant improvement, interaction effect and effect size between the groups of the Within-Subjects factor over the period of four weeks intervention, a repeated measures ANOVA test was conducted. The independent variables were the three experimental condition groups and proficiency level, whereas the dependent variables were the tests of epenthesis, dictation, picture-naming, and reading aloud tasks. For the repeated measures ANOVA test, the levels of the Within-Subjects factors were two: pre-test and post-test labelled time '1' and time '2' respectively. This applies to all the repeated measures ANOVA test conducted in this chapter. Also, a paired sample t-test was conducted by test token types using the pre-test and post-test of the nine test token types as paired variables in all the four tasks by the experimental condition groups. In addition, a Pearson's correlation analysis was conducted by pre-test and post-test production and perception to check if there was significant correlation between production and perception tests.

In the analyses, the results are statistically significant if $p \leq 0.05$. In order to check the assumption whether the data of the dependent variables are approximately normally distributed among the groups within the independent variables as required for a parametric test (e.g. Hatch & Lazaraton 1991, Larson-Hall 2010), visual inspection of box plot was conducted. This was done before the repeated measures ANOVA analysis. Effect size in the repeated measures ANOVA analysis was reported to look at how much the independent variables affect the dependent variables using Cohen's (1988) guidelines (small = 0.01, medium = 0.06 and large = 0.14). In addition, post-hoc comparisons are conducted to show the variation between the scores of the independent variables. The results by the effect of instruction are presented according to the four tasks based on the order they were administered (epenthesis perception task, dictation elicited written production task, elicited oral production picture-naming task and reading aloud task). Results by proficiency level and test token types are presented according to the three experimental condition groups/independent variable (i.e. listening + orthography:

LIST + ORTH group, listening-only: LIST group and traditional teaching method: TTM group) by task.

After dividing the 73 participants into the three experimental condition groups as described in Chapter Four section 4.7, their data were analysed and the results were used as a means of providing answers to the research questions of the study and to check if the results supported the hypotheses (see Chapter Four section 4.2.1 for the hypotheses).

In this section, the data of the participants are examined by the effect of instruction, i.e. by the different experimental condition groups based on the method of instruction used during the four weeks of instruction. The dependent variables are the scores on tests in epenthesis, dictation, picture-naming and reading aloud. Repeated measures ANOVA results are presented first followed by test tokens t-test results. The results are presented according to how the tasks were administered beginning with epenthesis task, dictation task, elicited oral production (picture-naming task) and finally reading aloud task. The traditional teaching method group results are presented first to show natural progression without additional treatment followed by the listening + orthography group and then the listening-only group. A descriptive analysis was first conducted to show the frequencies and percentages of the participants in each experimental condition group.

Table 5.8 Table of experimental condition groups' descriptive statistics

Experimental condition group	Frequency	Percent	Cumulative frequency
TTM	26	35.6	35.6
LIST + ORTH	24	32.9	68.5
LIST	23	31.5	100.0

Table 5.8 shows an approximately equal distribution of the participants with 24 participants in listening + orthography group, 23 participants in listening-only group and 26 participants in traditional teaching method group. With the frequencies and percentages of the experimental condition groups obtained, repeated measures ANOVA was conducted after first conducting a box plot visual inspection for assumption of normal distribution of the data with the experimental condition group as the independent variable and tests in epenthesis, dictation, picture-naming and reading aloud tasks as dependent variables.

Afterwards, the 40 test tokens used as stimuli in the pre-test and post-test on the four tasks were grouped into nine categories as described in Chapter Four section 4.6.1. A paired sample t-test analysis was conducted with the pre-test and post-test on the four tasks as the paired variables. This was in order to check whether there was statistically significant improvement between pre-test and post-test by the different groups on each test token over the period of four weeks of

instruction. It was also to check the group that improved significantly on the test tokens. The results provided evidence for the hypotheses of the study.

5.3.1 Results by effect of instruction on the epenthesis perception task

As a reminder, the epenthesis task as discussed in Chapter Four section 4.3.5.1 required participants to listen to the recordings of the test tokens in which three stimuli (ABX) for each of the 40 test tokens were presented in a sequential order. A vowel was inserted in one of the stimuli in either A or B. The matching stimuli in X could also have a vowel inserted in some of the tokens. The participants were asked to choose the option that matched with the sample stimuli in X between the options in A and B. This task was conducted to provide evidence for **H1.1** which predicts that:

H1.1 Experimental learners will be more sensitive in discriminating epenthesized stimulus when presented alongside the correct stimulus in the ABX epenthesis task.

A box plot visual inspection of normal distribution was conducted in line with the procedure for conducting the statistical analysis as required for a parametric study for the data of the experimental condition groups on the epenthesis task. There were no outliers detected in the box plots of both pre-test or post-test (see box plots in appendix I.1) as such the data was assumed to be approximately normally distributed and no data was excluded from the repeated measures ANOVA. The mean scores are shown in the bar chart in Figure 5.1.

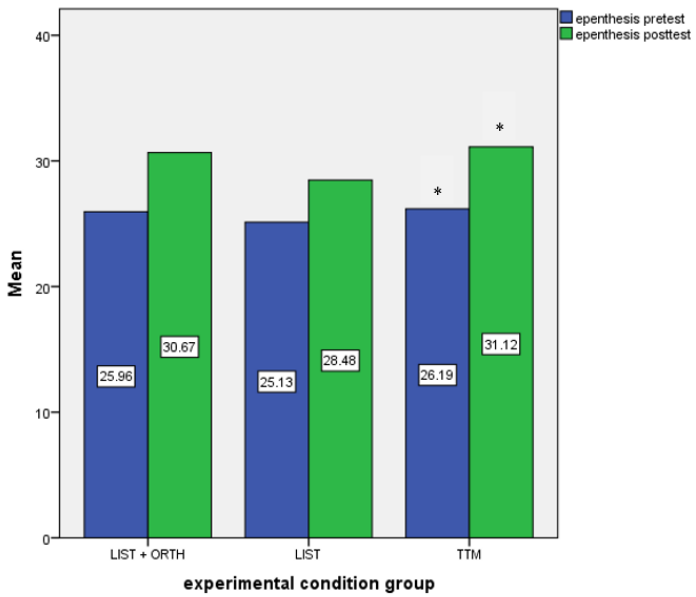


Figure 5.1 Experimental condition groups on the epenthesis task by the effect of instruction

The repeated measures ANOVA results in Table 5.9 show a combined statistically significant improvement ($p \leq 0.05$) by the experimental condition groups between pre-test and post-test on the epenthesis task ($p = 0.001$). However, post-hoc comparison using Bonferroni test as shown in Table 5.10 indicated that the score for the traditional teaching method group, listening + orthography group and listening only group were all not significantly different ($p = 1.000$). Although there was a significant improvement by the combined experimental condition groups on this task as seen in the main effect results of the repeated measures ANOVA ($p = 0.001$), there was no significant interaction effect revealed in Table 5.9 between pre-test and post-test on the epenthesis task by the effect of instruction ($p = 0.561$) and ($F = 0.582$) by the combined group. Partial eta squared stood at ($\eta p^2 = 0.016$), a small effect size indicating 1.6% effect of the improvement on the epenthesis task by the effect of instruction. In fact, the group scores were almost parallel. In other words, the effect of the significant improvement by the combined groups in the main effect result of the repeated measures ANOVA reported initially does not depend on the method of instruction used (either by listening while seeing the written forms, listening-only without seeing the written forms or by using the traditional teaching method).

Table 5.9 Repeated measures ANOVA table of experimental condition groups by the effect of instruction on the epenthesis task: Tests of Within-Subjects Effect

Source		F	Sig.	Partial Eta Squared
pre & post epenthesis	Sphericity Assumed	45.690	.000*	.395
	Greenhouse-Geisser	45.690	.000	.395
	Huynh-Feldt	45.690	.000	.395
	Lower-bound	45.690	.000	.395
pre & post epenthesis * condition	Sphericity Assumed	.582	.561	.016
	Greenhouse-Geisser	.582	.561	.016
	Huynh-Feldt	.582	.561	.016
	Lower-bound	.582	.561	.016

Table 5.10 Post-hoc table of Experimental condition groups' epenthesis task

(I) experimental condition group	(J) experimental condition group	Mean Difference (I-J)	Std. Error	Sig.[a]
LIST + ORTH	LIST	1.508	2.083	1.000
	TTM	-.341	2.021	1.000
LIST	LIST + ORTH	-1.508	2.083	1.000
	TTM	-1.849	2.043	1.000
TTM	LIST + ORTH	.341	2.021	1.000
	LIST	1.849	2.043	1.000

Based on estimated marginal means
a. Adjustment for multiple comparisons: Bonferroni.

Figure 5.1 shows the mean scores partitioned across pre-test and post-test by the different experimental condition groups showing the variation in the scores obtained between time '1' and time '2'. This confirms the non-significant interaction for groups between pre-test and post-

test as earlier mentioned. Even though the traditional teaching method group improved more than the listening + orthography group, the variation between the mean scores of the two groups was not significant (difference of 0.22 points). This means that using the traditional teaching method as well as using the listening + orthography or listening-only method led to equal improvements on epenthesis task (see appendix K.1 for the table of the mean scores and differences).

5.3.1.1 Epenthesis task all groups test token types

A paired sample t-test was conducted for the data of the experimental condition groups on the epenthesis task with pre-test and post-test epenthesis as paired variables. Their percentage correct scores were calculated showing the groups' percentage improvement between time '1' and time'2' in Table 5.11. This was done by adding up the total number of correct scores divided by the total number of stimuli times the total number of participants in each group.

Table 5.11 Percentage correct scores and differences of the groups on the epenthesis task pre-test and post-test

Epenthesis task		**Experimental condition groups**					
		TTM		**LIST + ORTH**		**LIST**	
		Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
Two-member clusters	Two-consonant onset	57.7%	73.8%	50.0%	65.8%	53.0%	63.5%
	% difference	16.1%		15.8%		10.5%	
	Two-consonant coda	66.9%	77.7%	64.2%	77.5%	61.7%	62.6%
	% difference	10.8%		13.3%		0.9%	
Three-member clusters	Three-consonant onset	53.8%	67.7%	43.3%	66.7%	47.8%	58.3%
	% difference	13.9%		23.4%		10.5%	
	Three consonant coda	56.9%	66.9%	60.0%	63.3%	46.1%	52.2%
	% difference	10%		3.3%		6.1%	
Silent singletons	Initial silent singletons	56.2%	66.2%	58.3%	65.0%	47.8%	56.5%
	% difference	10%		6.7%		8.7%	
	Mid/final silent singletons	56.9%	59.2%	54.2%	61.7%	47.8%	56.5%
	% difference	2.3%		7.5%		8.7%	
Digraph singletons	Initial digraph singletons	55.4%	67.7%	56.7%	63.3%	47.8%	57.4%
	% difference	12.3%		6.6%		9.6%	
	Final digraphs singletons	52.3%	64.6%	59.2%	65.8%	42.6%	56.5%
	% difference	12.3%		6.7%		13.9%	
Digraphs in clusters	Digraph clusters	71.5%	81.5%	73.3%	77.5%	58.3%	67.0%
	% difference	10%		4.2%		8.7%	

The percentages presented in Table 5.11 reveals the percentage correct scores of the groups in both pre-test and post-test on the nine test token types showing the percentage differences

between time'1' and time'2'. The traditional teaching method group improved more compared to the listening + orthography and listening-only groups on five out of the nine test tokens. This supports their significant improvement on the epenthesis task as reported in the results by the effect of instruction in section 5.3.1.

5.3.1.1.1 Traditional teaching method group

Table 5.12 shows the t-test results for the 26 participants in the traditional teaching method group. The t-test results revealed a combined significant improvement on almost all the test tokens with the exception of mid/final silent singletons that revealed no significant improvement between pre-test and post-test $p = 1.000$. There was statistically significant improvement ($p \leq 0.05$) on the other eight test tokens, these include two-consonant onsets $p = 0.006$, two-consonant codas $p = 0.036$, three-consonant onsets $p = 0.007$, three-consonant codas $p = 0.034$. Other tokens with significant improvements include initial silent singletons $p = 0.041$, initial digraph singletons $p = 0.040$, final digraph singletons $p = 0.050$ and digraph clusters $p = 0.056$.

Table 5.12 TTM all group epenthesis task pre-test vs post-test in the test token types

Test token types		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. D	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Two-member cluster	Two-consonant onsets pre-test & post-test	-.833	1.341	.274	-1.399	-.267	-3.045	23	.006*
	Two-consonant coda pre-test - & post-test	-.600	1.354	.271	-1.159	-.041	-2.216	24	.036*
Three-member cluster	Three-consonant onsets pre-test & post-test	-.833	1.373	.280	-1.413	-.254	-2.974	23	.007*
	Three-consonant coda pre-test & post-test	-.520	1.159	.232	-.998	-.042	-2.243	24	.034*
Silent singletons	Initial silent singletons pre-test & post-test	-.560	1.294	.259	-1.094	-.026	-2.165	24	.041*
	Mid/final silent singletons pre-test & post-test	.000	1.155	.231	-.477	.477	.000	24	1.000
Digraph singletons	Initial digraph pre-test & post-test	-.652	1.434	.299	-1.272	-.032	-2.182	22	.040*
	Final digraph pre-test & post-test	-.560	1.356	.271	-1.120	.000	-2.064	24	.050*
Digraphs in clusters	Cluster + digraph pre-test & post-test	-.480	1.194	.239	-.973	.013	-2.009	24	.056*

5.3.1.1.2 Listening + orthography group

The t-test results presented in Table 5.13 revealed a statistically significant improvement ($p \leq 0.05$) on only three test tokens (i.e. two-consonant onsets $p = 0.029$, two-consonant codas $p = 0.020$, and three-consonant onsets $p = 0.001$). The results of the other six tokens revealed no significant improvement (i.e. 3-consonant codas $p = 0.426$, initial silent singletons $p = 0.134$, mid/final silent singletons $p = 0.285$, initial digraph singletons $p = 0.175$, final digraph singletons $p = 0.200$, and digraph clusters $p = 0.468$).

Table 5.13 LIST + ORTH all group epenthesis task pre-test vs post-test in the test token types

Test token types		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. D	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Two-member cluster	Two-consonant onsets pre-test & post-test	-.792	1.668	.340	-1.496	-.088	-2.326	23	.029*
	Two-consonant coda pre-test - & post-test	-.667	1.308	.267	-1.219	-.114	-2.497	23	.020*
Three-member cluster	Three-consonant onsets pre-test & post-test	-1.130	1.325	.276	-1.703	-.558	-4.092	22	.000*
	Three-consonant coda pre-test & post-test	-.167	1.007	.206	-.592	.259	-.811	23	.426
Silent singletons	Initial silent singletons pre-test & post-test	-.381	1.117	.244	-.889	.127	-1.563	20	.134
	Mid/final silent singletons pre-test & post-test	-.227	.973	.207	-.658	.204	-1.096	21	.285
Digraph singletons	Initial digraph pre-test & post-test	-.333	1.167	.238	-.826	.160	-1.399	23	.175
	Final digraph pre-test & post-test	-.304	1.105	.230	-.782	.174	-1.321	22	.200
Digraphs in clusters	Cluster + digraph pre-test & post-test	-.208	1.382	.282	-.792	.375	-.738	23	.468

These results show that the listening + orthography group with explicit instruction using both listening and orthographic input did not improve significantly on most of the test tokens. The listening + orthography instruction method led to significant improvement in the perception of only two-member clusters (both onsets and codas) and three-consonant onsets. These can be considered less marked than three-consonant codas and digraph clusters, which did not reveal significant improvement. Also, no significant improvement was revealed in the results of silent singletons and digraph singletons. Recall that in the results on the effects of instruction presented in section 5.3.1, the traditional teaching method group improved more with higher variation in their mean scores than the listening + orthography and the listening-only group. However, the difference between their mean scores and that of the listening + orthography

group was not significant. As such, when comparing the results of the traditional teaching method group with that of the listening + orthography group on the test token types, we could see that although the listening + orthography group improved significantly on only three test tokens whereas the traditional teaching method group improved on eight tokens, the difference between their mean scorers is not significant (0.22 points).

5.3.1.1.3 Listening-only group

The t-test results of the data of the 23 participants of the listening-only group in Table 5.14 revealed a statistically significant improvement ($p \leq 0.05$) on only three test tokens (i.e. three-consonant onsets $p = 0.032$, mid/final silent singletons $p = 0.057$, and final digraph singletons $p = 0.008$). There was no significant improvement ($p > 0.05$) on the other six test tokens (i.e. two-consonant onsets $p = 0.145$, two-consonant codas $p = 0.853$, 3-consonant codas $p = 0.284$, initial silent singletons $p = 0.088$, initial digraph singletons $p = 0.077$, and digraph clusters 0.066).

Table 5.14 LIST all group epenthesis task pre-test vs post-test in the test token types

Test token types		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. D	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Two-member cluster	Two-consonant onsets pre-test & post-test	-.526	1.504	.345	-1.251	.199	-1.525	18	.145
	Two-consonant coda pre-test - & post-test	.045	1.133	.242	-.457	.548	.188	21	.853
Three-member cluster	Three-consonant onsets pre-test & post-test	-.682	1.393	.297	-1.300	-.064	-2.295	21	.032*
	Three-consonant coda pre-test & post-test	-.286	1.189	.260	- .827	.256	-1.101	20	.284
Silent singletons	Initial silent singletons pre-test & post-test	-.471	1.068	.259	-1.019	.078	-1.817	16	.088
	Mid/final silent singletons pre-test & post-test	-.435	1.037	.216	-.883	.014	-2.011	22	.057*
Digraph singletons	Initial digraph pre-test & post-test	-.478	1.238	.258	-1.014	.057	-1.852	22	.077
	Final digraph pre-test & post-test	-.696	1.146	.239	-1.191	-.200	-2.912	22	.008*
Digraphs in clusters	Cluster + digraph pre-test & post-test	-.435	1.080	.225	-.902	.032	-1.931	22	.066

The listening-only group, where learners only listened to the recordings of the instruction without any orthographic input, did not significantly improve perception on over half of the test tokens. Although the significant improvement of the listening-only group was on only three tokens like the listening + orthography group, when comparing the difference between their

mean scores as shown in Figure 5.1., there is a significant difference of 1.36 points which means that the listening + orthography group improved more than the listening-only group on the epenthesis task.

In sum, the hypothesis was not supported by the results of the epenthesis task, which predicted that the listening + orthography group with explicit instruction having both phonological and orthographic input will be sensitive in discriminating epenthesized stimulus when presented alongside the correct stimulus in the ABX epenthesis task compared to the listening-only and traditional teaching method groups. On the contrary, the traditional teaching method group yielded more significant improvement on the epenthesis task as shown in the results by the effect of instruction in section 5.3.1. This was also supported by the difference in percentage of correct scores shown in Table 5.11 which revealed the traditional teaching method group improved more, with higher percentages on five test tokens, compared to the listening + orthography and listening-only groups.

5.3.2 Results by the effect of instruction on the dictation elicited written production task

As described in Chapter Four section 4.3.5.1, the dictation task required the participants to listen to the script of the 40 test tokens played on a KNSTAR band radio. Each stimulus was repeated twice within ten seconds. The participants were required to write down the orthographic form of the words they heard. Then ten seconds after the previous stimulus, the next stimulus was heard. The correct spellings of the linguistic target of the study (e.g. two-consonant onset, three-consonant coda, initial silent singletons, etc.) were given 1 mark and incorrect 0. The marks were calculated numerically for the statistical analysis. This task was conducted to provide evidence for **H1.2** which predicts that:

H1.2 - Experimental learners will improve perception of the correspondences of words involving L2 English consonant clusters, digraphs in clusters, digraph singletons and silent singletons and consequently write them correctly in the dictation task due to the effect of orthography.

Visual inspection of box plots were conducted just like in the previous analysis. There were no outliers detected in both the box plots of pre-test and post-test (see box plots in appendix I.2). The data was assumed to be approximately normally distributed therefore no data was excluded from the analyses.

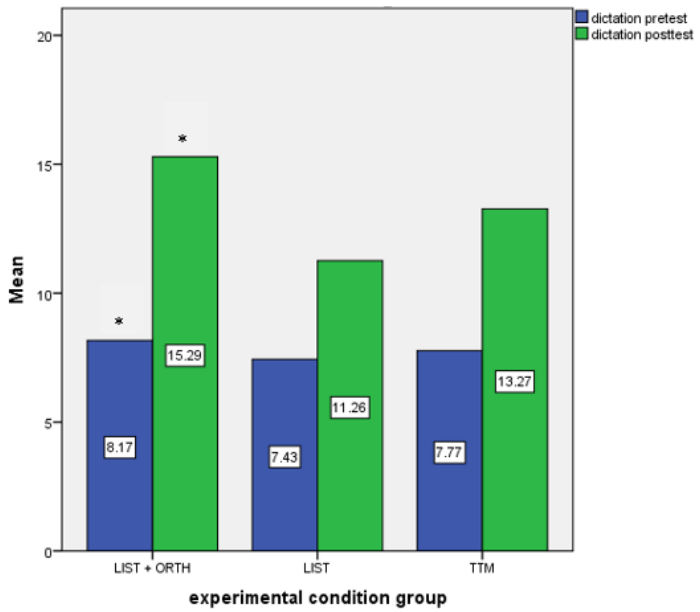


Figure 5.2 Experimental condition groups on the dictation task by the effect of instruction

The results of the repeated measures ANOVA main effect in Table 5.15 revealed a statistically significant improvement p = 0.001 by the combined experimental condition groups. This indicates that the participants all improved on the dictation task. However, post-hoc comparison using Bonferroni test shown in Table 5.16 indicated that the score for all the experimental condition groups was not significant $p > 0.5$. (p = 0.731 between listening + orthography and listening only, and p = 1.000 between traditional teaching method and both listening + orthography and listening only).

There was a significant interaction revealed in the repeated measures ANOVA results in Table 5.15 by the different experimental condition groups (p = 0.043) and (F = 3.293) with partial eta squared (ηp^2 = 0.086), indicating 8.6% of the improvement by the groups (a medium effect size). This means that there was a significantly non-parallel variation between the scores of the experimental condition groups between pre-test and post-test on the dictation task. The results suggest that the participants from the different experimental condition groups improved differently between pre-test and post-test on the dictation task, reflecting the impact of the different instruction methods. The variation between the groups' mean scores shown in Figure 5.2 reveals that using the listening + orthography method led to substantially higher scores on the dictation task (difference of 7.12 points, see appendix K.2) compared to using the traditional teaching method and the listening-only method. These results support **H1.2**.

Table 5.15 Repeated measures ANOVA table of experimental condition groups by the effect of instruction on the dictation task: Tests of Within-Subjects Effect

Source		F	Sig.	Partial Eta Squared
pre & post dictation	Sphericity Assumed	112.826	.000*	.617
	Greenhouse-Geisser	112.826	.000	.617
	Huynh-Feldt	112.826	.000	.617
	Lower-bound	112.826	.000	.617
pre & post dictation * condition	Sphericity Assumed	3.293	.043*	.086
	Greenhouse-Geisser	3.293	.043	.086
	Huynh-Feldt	3.293	.043	.086
	Lower-bound	3.293	.043	.086

Table 5.16 Post-hoc table of Experimental condition groups' dictation task

(I) experimental condition group	(J) experimental condition group	Mean Difference (I-J)	Std. Error	Sig.[a]
LIST + ORTH	LIST	2.381	2.026	.731
	TTM	1.210	1.965	1.000
LIST	LIST + ORTH	-2.381	2.026	.731
	TTM	-1.171	1.987	1.000
TTM	LIST + ORTH	-1.210	1.965	1.000
	LIST	1.171	1.987	1.000

Based on estimated marginal means
a. Adjustment for multiple comparisons: Bonferroni.

5.3.2.1 Dictation task all groups test token types

The pre-test and post-test of the participants served as the paired variables in the paired sample t-test analysis on the dictation task presented in the following sections. The percentage correct scores of the groups on the dictation task was calculated using the same method as used on the epenthesis task. The listening + orthography group significantly improved on five test tokens types as shown in the differences in their percentage scores between time'1' and time'2' in Table 5.17. This improvement shows the effect of orthographic input in the performance of the listening + orthography group compared to the listening-only method, with improvement on only one test token type. On the other hand, the traditional teaching method group who also had orthographic input with non-native speaker phonological input improved on three test token types on the dictation task. This shows that the listening + orthography method with native speaker audio input yielded greater improvement than the traditional teaching method with non-native speaker input.

Table 5.17 Percentage correct scores and differences of the groups on the dictation task pre-test and post-test

Dictation task		Experimental condition groups					
		TTM		LIST + ORTH		LIST	
		Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
Two-member clusters	Two-consonant onset	28.5%	50.8%	34.2%	56.7%	31.3%	40.0%
	% difference	22.3%		22.5%		8.7%	
	Two-consonant coda	29.2%	48.5%	25.0%	45.8%	25.2%	28.7%
	% difference	19.3%		20.8%		3.5%	
Three-member clusters	Three-consonant onset	7.7%	23.8%	11.7%	28.3%	7.8%	16.5%
	% difference	19.1%		16.6%		8.7%	
	Three consonant coda	10.6%	19.2%	8.3%	28.1%	7.6%	25.0%
	% difference	8.6%		19.8%		17.4%	
Silent singletons	Initial silent singletons	7.7%	28.8%	6.3%	25.0%	5.4%	23.9%
	% difference	21.1%		18.7%		18.5%	
	Mid/final silent singletons	1.9%	11.5%	5.2%	15.6%	2.2%	7.6%
	% difference	9.1%		10.4%		5.4%	
Digraph singletons	Initial digraph singletons	51.9%	53.8%	54.2%	66.7%	39.1%	52.2%
	% difference	1.9%		12.5%		13.1%	
	Final digraphs singletons	11.5%	26.9%	19.8%	28.1%	16.3%	21.7%
	% difference	15.4%		8.3%		5.4%	
Digraphs in clusters	Digraph clusters	22.3%	30.0%	19.2%	34.2%	16.5%	28.7%
	% difference	7.7%		15%		12.2%	

5.3.2.1.1 Traditional teaching method group

A statistically significant improvement was revealed in the results of the traditional teaching method group's test tokens as shown in Table 5.18 on the two-member clusters (two-consonant onsets $p = 0.001$ and two-consonant codas $p = 0.002$) and silent singletons (initial silent singletons $p = 0.001$ and mid/final silent singletons $p = 0.030$). Significant improvement was also revealed in the results of three-consonant onsets $p = 0.001$, and final digraph singletons $p = 0.004$. On the other hand, non-significant improvement was revealed in the results of three-consonant codas $p = 0.073$, initial digraph singletons $p = 0.417$ and digraphs in clusters $p = 0.076$.

Table 5.18 TTM all group dictation task pre-test vs post-test in the test token types

Test token types		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. D	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Two-member cluster	Two-consonant onsets pre-test & post-test	-1.120	1.092	.218	-1.571	-.669	-5.126	24	.000*
	Two-consonant coda pre-test - & post-test	-.957	1.331	.277	-1.532	-.381	-3.447	22	.002*
Three-member cluster	Three-consonant onsets pre-test & post-test	-.864	1.082	.231	-1.343	-.384	-3.743	21	.001*
	Three-consonant coda pre-test & post-test	-.333	.868	.177	-.700	.033	-1.881	23	.073
Silent singletons	Initial silent singletons pre-test & post-test	-.875	1.035	.211	-1.312	-.438	-4.143	23	.000*
	Mid/final silent singletons pre-test & post-test	-.261	.541	.113	-.495	-.027	-2.313	22	.030*
Digraph singletons	Initial digraph pre-test & post-test	-.125	.741	.151	-.438	.188	-.827	23	.417
	Final digraph pre-test & post-test	-.520	.823	.165	-.860	-.180	-3.161	24	.004*
Digraphs in clusters	Cluster + digraph pre-test & post-test	-.385	1.061	.208	-.813	.044	-1.848	25	.076

The results of the traditional teaching method group showed that English instruction involving the use of the traditional teaching method with orthographic input and the non-native speaking English teacher phonological input may not be a complete write-off because it yielded significant improvements on six out of the nine test token types.

5.3.2.1.2 Listening + orthography group

A t-test analysis of the listening + orthography group generated the results in Table 5.19 which revealed a statistically significant improvement ($p \leq 0.05$) on all nine test tokens on the dictation task (two-consonant onsets $p = 0.001$, two consonant codas $p = 0.001$, three-consonant onsets $p = 0.001$, three consonant codas $p = 0.001$, initial silent singletons $p = 0.001$, mid/final silent singletons $p = 0.030$, initial digraph singletons $p = 0.031$, final digraph singletons $p = 0.057$, and digraphs in clusters $p = 0.001$).

Table 5.19 LIST + ORTH all group dictation task pre-test vs post-test in the test token types

Test token types		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. D	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Two-member cluster	Two-consonant onsets pre-test & post-test	-1.125	.741	.151	-1.438	-.812	-7.439	23	.000*
	Two-consonant coda pre-test - & post-test	-.833	1.129	.231	-1.310	-.356	-3.615	23	.001*
Three-member cluster	Three-consonant onsets pre-test & post-test	-1.042	.999	.204	-1.464	-.620	-5.108	23	.000*
	Three-consonant coda pre-test & post-test	-.952	1.024	.223	-1.418	-.486	-4.264	20	.000*
Silent singletons	Initial silent singletons pre-test & post-test	-.789	.631	.145	-1.093	-.486	-5.457	18	.000*
	Mid/final silent singletons pre-test & post-test	-.286	.561	.122	-.541	-.031	-2.335	20	.030*
Digraph singletons	Initial digraph pre-test & post-test	-.500	1.012	.216	-.949	-.051	-2.318	21	.031*
	Final digraph pre-test & post-test	-.333	.816	.167	-.678	.011	-2.000	23	.057*
Digraphs in clusters	Cluster + digraph pre-test & post-test	-.783	.902	.188	-1.173	-.392	-4.159	22	.000*

These significant improvements show the effectiveness on the dictation task of using listening while having orthographic input. The results of the listening + orthography group supported the prediction in **H1.2** that explicit phonological and orthographic instruction along with listening led to significant improvement in the perception of correct spellings on the dictation task. This significant improvement was revealed on all consonant clusters, digraphs in clusters, silent singletons and digraph singletons. Comparing the results of the traditional teaching method group in Table 5.18 with that of the listening + orthography group in Table 5.19 which both had orthographic input during instruction, the listening + orthography group who had English native speaker recorded aural input yielded significant improvements on the dictation task test tokens compared to the traditional teaching method group who had English non-native speaker aural input. This explains the percentage scores presented in Table 5.17

5.3.2.1.3 Listening-only group

The results of the listening-only group in Table 5.20 revealed significant improvements ($p \leq 0.05$) between pre-test and post-test in three-member clusters (consisting of three-consonant onsets $p = 0.038$, and three-consonant codas $p = 0.003$), initial silent singletons $p = 0.001$, initial digraph singletons $p = 0.038$ and digraphs in clusters $p = 0.024$. There was no significant improvement ($p > 0.05$) on any of the two-member clusters (consisting of two-consonant $p =$

0.116 onsets and two-consonant codas $p = 0.358$), mid/final silent singletons $p = 0.104$ and final digraph singletons $p = 0.135$.

Table 5.20 LIST all group dictation task pre-test vs post-test on the test token types

Test token types		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. D	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Two-member cluster	Two-consonant onsets pre-test & post-test	-.435	1.273	.265	-.985	.116	-1.638	22	.116
	Two-consonant coda pre-test - & post-test	-.182	.907	.193	-.584	.220	-.940	21	.358
Three-member cluster	Three-consonant onsets pre-test & post-test	-.524	1.078	.235	-1.014	-.033	-2.227	20	.038*
	Three-consonant coda pre-test & post-test	-.727	1.032	.220	-1.185	-.270	-3.306	21	.003*
Silent singletons	Initial silent singletons pre-test & post-test	-.773	.922	.197	-1.182	-.364	-3.930	21	.001*
	Mid/final silent singletons pre-test & post-test	-.182	.501	.107	-.404	.040	-1.702	21	.104
Digraph singletons	Initial digraph pre-test & post-test	-.500	1.058	.226	-.969	-.031	-2.217	21	.038*
	Final digraph pre-test & post-test	-.217	.671	.140	-.508	.073	-1.553	22	.135
Digraphs in clusters	Cluster + digraph pre-test & post-test	-.600	1.095	.245	-1.113	-.087	-2.449	19	.024*

The results show that the listening-only method did not lead to significant improvement by the listening-only group on two-member clusters both in onset and coda positions, which are considered to be less marked than the three-member clusters that they significantly improved. Comparing the listening-only group's results to that of the listening + orthography group being the two groups that received treatment, the results revealed that using the listening + orthography method led to significant improvements on the dictation task vs using the listening-only method. This suggests that in oral English instruction, it is better to give pronunciation instruction using both phonological input and orthographic input at the same time because it yields more significant improvement than using only phonological input without any orthographic input.

In sum, the results of the dictation task support **H1.2** which predicts that experimental learners will improve perception of the correspondences of words involving L2 English consonant clusters, digraphs in clusters, digraph singletons and silent singletons and consequently write them correctly in the dictation task due to the effect of orthography..

5.3.3 Results by the effect of instruction on the elicited oral production picture-naming task

As a reminder, the picture-naming task required the participants to view the pictures of the 40 test tokens and produce the relevant words in a ten minute meeting with the research assistants. The pictures had been arranged on Power Point slides with one picture per slide and then printed in colour. The print-outs of the pictures were pasted on a flip chart with one picture per page and presented to the participants individually. They were required to say the word for the image in the picture on each page of the flip chart then three seconds after the previous picture, the next picture was flipped over. Their production was recorded on a Sony digital recorder. The recorded files were run through Praat speech analysis software and given marks using the researcher's judgement for correct production of the test stimuli. Productions were judged as correct if there were no vowel epenthesis, consonant/digraph reduction, phone substitution, metathesis, orthographic production, loanword productions, and were awarded 1 mark; and 0 for incorrect. A spot-check marking was also conducted by two other female non-native speakers of English (Russian and Arabic) as a vetting of the main researcher's judgements (see section 4.8.2 on spot-check judgment). Correct productions were calculated numerically and reported statistically using repeated measures ANOVA test. This task was conducted to provide evidence to support **H1.4** which predicts that experimental learners will improve in producing the test stimuli when presented with their pictures in the picture-naming task.

Box plot visual assessment was conducted and entry 25 from the traditional teaching method group had a particularly high score in the post-test while entry 64 also from the traditional teaching method group had a particularly low score (as shown in appendix I.3). Hence, to ensure the assumption of normal distribution of the data, their pre-test and post-test data was excluded from the repeated measures ANOVA analysis of the dictation task. This is because the data for both time '1' and time '2' was needed for the analyses.

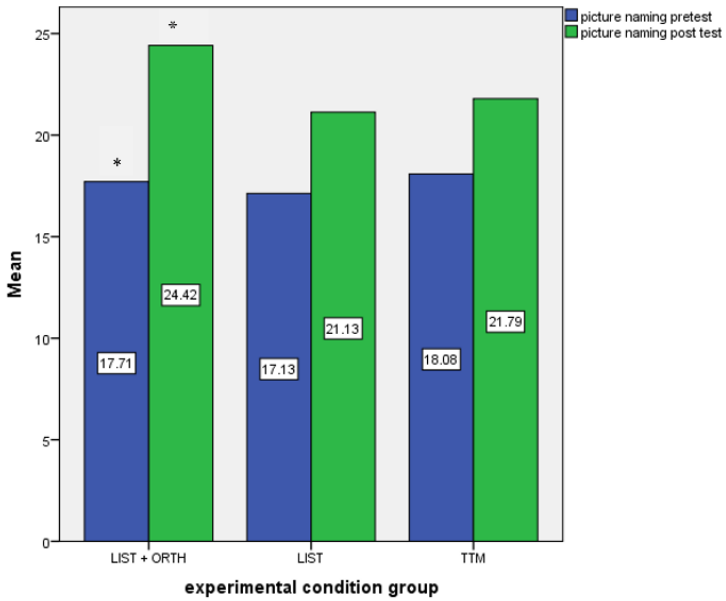


Figure 5.3 Experimental condition groups on the picture-naming task by the effect of instruction

The results of the repeated measures ANOVA in Table 5.21 revealed a statistically significant improvement ($p \leq 0.05$) by the combined experimental condition groups $p = 0.001$. Post-hoc comparison using Bonferroni test shown in Table 5.22 revealed that the score between all the experimental condition groups was not significant ($p > 0.5$). The traditional teaching method group revealed non-statistically significant score ($p = 1.000$) between both the listening + orthography group and listening only groups. There was a non-significant difference between the scores of the listening + orthography group and the listening only group ($p = 0.622$).

Table 5.21 Repeated measures ANOVA table of experimental condition groups by the effect of instruction on the picture-naming task: Tests of Within-Subjects Effect

Source		F	Sig.	Partial Eta Squared
pre & post picture-naming	Sphericity Assumed	95.101	.000*	.583
	Greenhouse-Geisser	95.101	.000	.583
	Huynh-Feldt	95.101	.000	.583
	Lower-bound	95.101	.000	.583
pre & post picture-naming * condition	Sphericity Assumed	3.792	.027*	.100
	Greenhouse-Geisser	3.792	.027	.100
	Huynh-Feldt	3.792	.027	.100
	Lower-bound	3.792	.027	.100

Table 5.22 Post-hoc table of Experimental condition groups' picture-naming task

(I) experimental condition group	(J) experimental condition group	Mean Difference (I-J)	Std. Error	Sig.[a]
LIST + ORTH	LIST	1.932	1.518	.622
	TTM	.917	1.502	1.000
LIST	LIST + ORTH	-1.932	1.518	.622
	TTM	-1.015	1.518	1.000
TTM	LIST + ORTH	-.917	1.502	1.000
	LIST	1.015	1.518	1.000

Based on estimated marginal means
a. Adjustment for multiple comparisons: Bonferroni.

The repeated measures ANOVA results in Table 5.21 revealed a significant interaction effect experimental condition group ($p = 0.027$) and ($F = 3.792$) with partial eta squared ($\eta p^2 = 0.100$), indicating 10% of the improvement by groups, (a medium effect size). These results show the effect of the different instruction methods used for the experimental condition groups by the differences in scores obtained between pre-test and post-test. Figure 5.3 reveals the mean scores obtained by the groups at pre-test and post-test.

The mean scores in Figure 5.3 reveal that there was a significant variation between the scores of the listening + orthography group compared to the listening-only group and traditional teaching method group (see appendix K.3 for the summary of the mean scores and variations). These results show that the listening + orthography group improved in elicited oral production of the test tokens compared to the listening-only group and the traditional teaching method group. In the next section, the percentage scores of the groups are presented to show the test tokens that yielded the significant improvement for each of the groups.

5.3.3.1 Picture-naming task all groups test token types

A t-test analysis was conducted for the data of the participants in the elicited oral production picture-naming task using the pre-test and post-test data of the nine test token types as paired variables. Here as in the perception tests in epenthesis and dictation task, the percentage scores of the groups at pre-test and post-test were calculated and are shown in Table 5.23 with the difference in percentage scores between time '1' and time '2'. As seen in the previous section 5.3.3 on the effect of instruction on the picture-naming task, the listening + orthography group improved significantly more than the listening-only and the traditional teaching method groups as seen on the bar chart in Figure 5.3. This is reflected in the differences in the percentage scores of the groups in Table 5.23 whereby the listening + orthography group improved better on seven out of the nine test token types. The listening-only group had better variation between their percentage scores on two-consonant onset and initial digraph singletons; however, there was a

decrease in their percentage scores on more marked three-member clusters (-3.5% on three-consonant onset and -6.8% on three-consonat coda).

Table 5.23 Percentage correct scores and differences of the groups on the picture-naming task pre-test and post-test

Picture-naming task		Experimental condition groups					
		TTM		LIST + ORTH		LIST	
		Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
Two-member clusters	Two-consonant onset	82.3%	90.0%	81.7%	92.5%	77.4%	92.2%
	% difference	7.7%		10.8%		14.8%	
	Two-consonant coda	29.2%	40.0%	25.8%	40.0%	29.6%	30.4%
	% difference	10.8%		14.2%		0.8%	
Three-member clusters	Three-consonant onset	21.5%	29.2%	19.2%	37.5%	28.7%	25.2%
	% difference	7.7%		18.3%		-3.5%	
	Three consonant coda	35.6%	46.2%	30.2%	50.0%	37.0%	30.4%
	% difference	10.6%		19.8%		-6.8%	
Silent singletons	Initial silent singletons	25.0%	40.4%	24.0%	44.8%	21.7%	34.8%
	% difference	15.4%		20.8%		3.1%	
	Mid/final silent singletons	60.6%	77.9%	49.0%	72.9%	56.5%	78.3%
	% difference	17.3%		23.9%		21.8%	
Digraph singletons	Initial digraph singletons	61.5%	65.4%	65.6%	68.8%	57.6%	68.5%
	% difference	3.9%		3.2%		10.9%	
	Final digraphs singletons	55.8%	66.3%	53.1%	74.0%	46.7%	59.8%
	% difference	10.5%		20.9%		13.1%	
Digraphs in clusters	Digraph clusters	44.6%	56.2%	46.7%	65.0%	39.1%	56.5%
	% difference	11.6%		18.3%		17.4%	

5.3.3.1.1 Traditional teaching method group

Table 5.24 revealed a statistically significant improvement ($p \leq 0.05$) between pre-test and post-test by the traditional teaching method group on the two-member clusters (i.e. two-consonant onsets $p = 0.015$ and two-consonant codas $p = 0.036$), silent singletons (i.e. initial silent singletons $p = 0.020$ and mid/final singletons $p = 0.001$), final digraph singletons $p = 0.013$ and digraph clusters $p = 0.002$. A non-significant improvement ($p > 0.05$) was revealed in the results of three-member clusters (i.e. three-consonant onsets $p = 0.083$ and three-consonant codas $p = 0.167$), and initial digraph singletons $p = 0.204$. Although the traditional teaching method group had significant improvement on six out of nine test token types, but the listening + orthography group performed better between pre-test and post-test as seen in the variation of the percentage of correct scores between pre-test and post-test.

Table 5.24 TTM all group picture-naming task pre-test vs post-test in the test token types

Test token types		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. D	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Two-member cluster	Two-consonant onsets pre-test & post-test	-.400	.764	.153	-.715	-.085	-2.619	24	.015*
	Two-consonant coda pre-test - & post-test	-.409	.854	.182	-.788	-.030	-2.247	21	.036*
Three-member cluster	Three-consonant onsets pre-test & post-test	-.375	1.013	.207	-.803	.053	-1.813	23	.083
	Three-consonant coda pre-test & post-test	-.333	1.065	.232	-.818	.151	-1.435	20	.167
Silent singletons	Initial silent singletons pre-test & post-test	-.556	.922	.217	-1.014	-.097	-2.557	17	.020*
	Mid/final silent singletons pre-test & post-test	-.652	.714	.149	-.961	-.343	-4.380	22	.000*
Digraph singletons	Initial digraph pre-test & post-test	-.238	.831	.181	-.616	.140	-1.313	20	.204
	Final digraph pre-test & post-test	-.458	.833	.170	-.810	-.107	-2.696	23	.013*
Digraphs in clusters	Cluster + digraph pre-test & post-test	-.577	.857	.168	-.923	-.231	-3.434	25	.002*

5.3.3.1.2 Listening + orthography group

The results of the listening + orthography group in Table 5.25 show the differences in the group's performance between pre-test and post-test after four weeks of instruction. A statistically significant improvement ($p \leq 0.05$) was revealed on all the nine test token types as follows, two-consonant onsets $p = 0.002$, two consonant codas $p = 0.001$, three-consonant onsets $p = 0.001$, three consonant codas $p = 0.001$, initial silent singletons $p = 0.001$, mid/final silent singletons $p = 0.001$, initial digraph singletons $p = 0.056$, final digraph singletons $p = 0.001$, and digraph clusters $p = 0.001$. Comparing the results of the listening + orthography group with that of the traditional teaching method, the listening + orthography method results support **H1.4**. The listening + orthography group obtained more significant improvements on all the picture-naming test token types than the traditional teaching method group. This is also reflected in the percentages of their scores as shown in Table 5.23.

Table 5.25 LIST + ORTH all group picture-naming task pre-test vs post-test in the test token types

Test token types		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. D	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Two-member cluster	Two-consonant onsets pre-test & post-test	-.542	.779	.159	-.871	-.213	-3.406	23	.002*
	Two-consonant coda pre-test - & post-test	-.714	.717	.156	-1.041	-.388	-4.564	20	.000*
Three-member cluster	Three-consonant onsets pre-test & post-test	-1.000	1.243	.259	-1.538	-.462	-3.858	22	.001*
	Three-consonant coda pre-test & post-test	-.783	.850	.177	-1.150	-.415	-4.413	22	.000*
Silent singletons	Initial silent singletons pre-test & post-test	-.850	.933	.209	-1.287	-.413	-4.073	19	.001*
	Mid/final silent singletons pre-test & post-test	-1.043	1.147	.239	-1.540	-.547	-4.362	22	.000*
Digraph singletons	Initial digraph pre-test & post-test	-.261	.619	.129	-.529	.007	-2.021	22	.056*
	Final digraph pre-test & post-test	-.833	.761	.155	-1.155	-.512	-5.362	23	.000*
Digraphs in clusters	Cluster + digraph pre-test & post-test	-.917	1.018	.208	-1.347	-.487	-4.412	23	.000*

5.3.3.1.3 Listening-only group

A paired sample t-test was conducted to check if there was statistically significant improvement between pre-test and post-test of the listening-only group on the picture-naming task. The t-test results in Table 5.26 revealed significant improvement ($p \leq 0.05$) on the two-consonant onsets $p = 0.002$, silent singletons (consisting of initial silent singletons $p = 0.001$ and mid/final silent singletons $p = 0.001$), digraph singletons (consisting of initial digraph singletons $p = 0.022$ and final digraph singletons $p = 0.011$), and digraph clusters $p = 0.001$. On the other hand, a non-significant improvement was revealed in the results of two-consonant coda $p = 0.833$ and three-member cluster (consisting of three-consonant onsets $p = 0.426$ and three consonant coda $p = 0.110$. The results of the listening-only group compared to that of the traditional teaching method group showed similar improvements on the test tokens, with significant improvements on six out of the nine token types. Comparing the results of the listening-only group with that of the listening + orthography group, the listening + orthography instruction method yielded more significant improvement than the listening-only method on the elicited oral production in picture-naming task as shown in their results. Although the listening-only group had greater differences between pre-test and post-test on two-consonant onset and initial digraph singletons in Table 5.23, this was not significant. Looking at the general improvements of the groups on

the picture-naming task, the listening + orthography group had higher percentage differences on the other test token types than both listening-only and traditional teaching methods.

Table 5.26 LIST all group picture-naming task pre-test vs post-test in the test token types

Test token types		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. D	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Two-member cluster	Two-consonant onsets pre-test & post-test	-.636	.848	.181	-1.012	-.261	-3.521	21	.002*
	Two-consonant coda pre-test - & post-test	.045	.999	.213	-.397	.488	.213	21	.833
Three-member cluster	Three-consonant onsets pre-test & post-test	.174	1.029	.215	-.271	.619	.810	22	.426
	Three-consonant coda pre-test & post-test	.261	.752	.157	-.064	.586	1.664	22	.110
Silent singletons	Initial silent singletons pre-test & post-test	-.571	.676	.148	-.879	-.264	-3.873	20	.001*
	Mid/final silent singletons pre-test & post-test	-.870	.968	.202	-1.288	-.451	-4.309	22	.000*
Digraph singletons	Initial digraph pre-test & post-test	-.435	.843	.176	-.800	-.070	-2.472	22	.022*
	Final digraph pre-test & post-test	-.522	.898	.187	-.910	-.133	-2.787	22	.011*
Digraph clusters	Cluster + digraph pre-test & post-test	-.870	.920	.192	-1.267	-.472	-4.534	22	.000*

Overall, the results of the picture-naming task support **H1.4**, which predicts that experimental learners will improve in producing the test stimuli when presented with their pictures in the picture-naming task. These results demonstrate that having the right (native speaker) English aural input with orthographic input was better compared to having only native speaker aural input with no orthographic input, or having non-native speaker of English aural input with orthographic input. This is because the listening + orthography instruction method yielded more significant improvements on the elicited oral production picture-naming task as shown in the results by the effect of instruction in section 5.3.3. We have also seen that the listening + orthography method led to improvement in the group's scores as seen by the differences in the percentage of the correct scores of the groups as shown in Table 5.23 which revealed the listening + orthography group with higher differences between their scores at pre-test and post-test in majority of the test token types.

5.3.4 Results by the effect of instruction on the reading aloud task

Recall that the reading aloud task required participants to look at the words of the 40 test tokens in isolation and produce the relevant words in a ten-minute meeting with the research assistant

while their production was recorded on a Sony digital recorder. The words were written in boldface upper case in black and size 166-point. Like in the picture naming task, the slides were arranged on Power Point with one word per slide and then printed out. The print-outs were pasted on a flip chart and presented to the participants. There was a three-second transition before the slide was flipped over for the next word. The recorded files were run through Praat speech analysis software and the same procedure as for the picture-naming task was used to give marks for correct production of the linguistic targets for the stimulus. Spot-check marking was then done by the two other female NNS of English (see section 3.6.4). This task was conducted to provide evidence for **H1.3**, which predicts that:

H1.3 - Experimental learners will exhibit better production of grapheme-phoneme correspondences due to the availability of orthography in the monitored oral reading production task.

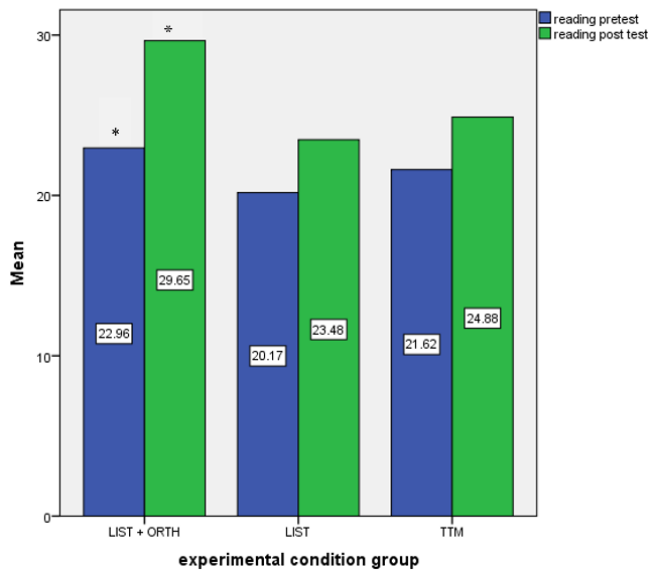


Figure 5.4 Experimental condition groups on the reading aloud task by the effect of instruction

Box plot visual inspection was conducted and the box plot of pre-test did not reveal any outlier. Entry 8 from the listening + orthography group was revealed as an outlier in the box plot of post-test with a particularly low score and the data of entry 8 was excluded from the analyses. This is in order to ensure the assumption that the data was normally distributed (see appendix I.4 for the pre-test and post-test box plots).

A statistically significant improvement ($p \leq 0.05$) was revealed in the repeated measures ANOVA results of the combined experimental condition groups between pre-test and post-test on the reading aloud task ($p = 0.001$). Post-hoc comparison using Bonferroni test as shown in

Table 5.28 indicated that the score between all the experimental condition groups was not statistically significant $p > 0.5$.

There was also a significant interaction revealed by the experimental condition groups between pre-test and post-test on the reading aloud task by the effect of instruction ($p = 0.004$) and ($F = 6.068$) with partial eta squared ($\eta p^2 = 0.150$) indicating 15% (a large effect size) of the impact of the scores obtained.

Table 5.27 Repeated measures ANOVA table of experimental condition groups by the effect of instruction on the reading aloud task: Tests of Within-Subjects Effect

Source		F	Sig.	Partial Eta Squared
pre & post reading	Sphericity Assumed	93.605	.000*	.576
	Greenhouse-Geisser	93.605	.000	.576
	Huynh-Feldt	93.605	.000	.576
	Lower-bound	93.605	.000	.576
pre & post reading * group	Sphericity Assumed	6.068	.004*	.150
	Greenhouse-Geisser	6.068	.004	.150
	Huynh-Feldt	6.068	.004	.150
	Lower-bound	6.068	.004	.150

Table 5.28 Post-hoc table of Experimental condition groups' reading aloud task

(I) experimental condition group	(J) experimental condition group	Mean Difference (I-J)	Std. Error	Sig.[a]
LIST + ORTH	LIST	4.478	2.932	.394
	TTM	3.054	2.846	.861
LIST	LIST + ORTH	-4.478	2.932	.394
	TTM	-1.424	2.846	1.000
TTM	LIST + ORTH	-3.054	2.846	.861
	LIST	1.424	2.846	1.000

Based on estimated marginal means
a. Adjustment for multiple comparisons: Bonferroni.

Figure 5.4 shows the mean scores obtained by the experimental condition groups on the reading aloud task (see appendix K.4 for the variation in the scores obtained between pre-test and post-test). As shown in the repeated measures ANOVA results in Table 5.27 there was a significant interaction effect ($p = 0.004$) between pre-test and post-test by the different groups based on the method of instruction (i.e. listening + orthography, listening-only, and traditional teaching method). The differences in scores from pre-test to post-test shown in Figure 5.4 shows the listening + orthography group as the most improved group with a difference of 6.69 points between time '1' and time '2'.

5.3.4.1 Reading aloud task all groups test token types

A t-test analysis was conducted for the data of the experimental condition groups on the nine test token types with test in reading at time '1' and time '2' as the paired variables. The

percentage of correct score of the groups was calculated in the same manner as the previous tests. Table 5.29 shows the percentages of the groups with the differences between time '1' and time '2'.

Table 5.29 Percentage correct scores and differences of the groups on the reading aloud task pre-test and post-test

Reading aloud task		Experimental condition groups					
		TTM		LIST + ORTH		LIST	
		Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
Two-member clusters	Two-consonant onset	82.3%	87.7%	74.2%	85.8%	78.3%	86.1%
	% difference	5.4%		11.6%		7.8%	
	Two-consonant coda	56.9%	63.1%	64.2%	71.7%	56.5%	62.6%
	% difference	6.2%		7.5%		6.1%	
Three-member clusters	Three-consonant onset	38.5%	43.8%	47.5%	63.3%	33.0%	45.2%
	% difference	5.3%		15.8%		12.0%	
	Three-consonant coda	64.4%	76.0%	59.4%	74.0%	62.0%	66.3%
	% difference	11.6%		14.6%		4.3%	
Silent singletons	Initial silent singletons	30.8%	45.2%	28.1%	60.4%	25.0%	32.6%
	% difference	14.4%		32.3%		7.6%	
	Mid/final silent singletons	41.3%	48.1%	37.5%	55.2%	41.3%	47.8%
	% difference	7%		17.7%		6.5%	
Digraph singletons	Initial digraph singletons	62.5%	64.4%	64.6%	77.1%	47.8%	59.8%
	% difference	1.9%		12.5%		12%	
	Final digraphs singletons	57.7%	70.2%	64.6%	80.2%	58.7%	63.0%
	% difference	12.5%		15.6%		4.3%	
Digraphs in clusters	Digraph clusters	51.5%	59.2%	56.7%	78.3%	50.4%	58.3%
	% difference	7.7%		21.6%		7.9%	

The effect of orthographic input on the reading aloud task was revealed in the percentage scores of the listening + orthography group. They improved more on all the test token types between pre-test and post-test than the traditional teaching method group and the listening-only group. These percentages reflect the mean scores presented in Figure 5.4 which shows the listening + orthography group with greater improvement between time '1' and time '2' thus suggesting it as the more improved group on the reading aloud task.

5.3.4.1.1 Traditional teaching method group

Table 5.30 shows the results from the t-test analysis of traditional teaching method group on the nine test token types on the reading aloud task. A significant improvement ($p \leq 0.05$) was revealed on only two test token types i.e. initial silent singletons $p = 0.001$ and final digraph singletons $p = 0.002$. The results of the other seven test tokens revealed a non-significant

improvement, these include (two-consonant onsets $p = 0.228$, two consonant codas $p = 0.309$, three-consonant onsets $p = 0.410$, three consonant codas $p = 0.086$, mid/final silent singletons $p = 0.090$, initial digraph singletons $p = 0.576$, and digraph clusters $p = 0.086$). Although the traditional teaching method had orthographic input with non-native speakers of English aural input during instruction, this did not yield significant improvement on their performance on the reading aloud task.

Table 5.30 TTM all group reading aloud task pre-test vs post-test in the test token types

Test token types		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. D	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Two-member cluster	Two-consonant onsets pre-test & post-test	-.250	.989	.202	-.668	.168	-1.238	23	.228
	Two-consonant coda pre-test - & post-test	-.238	1.044	.228	-.713	.237	-1.045	20	.309
Three-member cluster	Three-consonant onsets pre-test & post-test	-.280	1.671	.334	-.970	.410	-.838	24	.410
	Three-consonant coda pre-test & post-test	-.458	1.250	.255	-.986	.070	-1.796	23	.086
Silent singletons	Initial silent singletons pre-test & post-test	-.577	.703	.138	-.861	-.293	-4.186	25	.000*
	Mid/final silent singletons pre-test & post-test	-.269	.778	.152	-.583	.045	-1.766	25	.090
Digraph singletons	Initial digraph pre-test & post-test	-.091	.750	.160	-.424	.242	-.568	21	.576
	Final digraph pre-test & post-test	-.550	.686	.153	-.871	-.229	-3.584	19	.002*
Digraphs in clusters	Cluster + digraph pre-test & post-test	-.385	1.098	.215	-.828	.059	-1.786	25	.086

5.3.4.1.2 Listening + orthography group

The results in Table 5.31 revealed a statistically significant improvement ($p \leq 0.05$) on all the nine test tokens by the listening + orthography group indicating a combined improvement between pre-test and post-test on the reading aloud task. These include (two-consonant onsets $p = 0.003$, two consonant codas $p = 0.005$, three-consonant onsets $p = 0.001$, three consonant codas $p = 0.004$, initial silent singletons $p = 0.001$, mid/final silent singletons $p = 0.003$, initial digraph singletons $p = 0.001$, final digraph singletons $p = 0.005$, and digraph clusters $p = 0.001$). The listening + orthography group had orthographic input and English native speaker recorded aural input during instruction, the effect is seen in their significant improvement on the reading aloud test token types. This shows that using listening + orthography instruction method was

an effective method that yielded significant improvement on the reading aloud task as seen in the variation in the percentage scores in Table 5.29.

Table 5.31 LIST + ORTH all group reading aloud task pre-test vs post-test in the test token types

Test token types		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. D	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Two-member cluster	Two-consonant onsets pre-test & post-test	-.636	.902	.192	-1.036	-.236	-3.309	21	.003*
	Two-consonant coda pre-test - & post-test	-.435	.662	.138	-.721	-.148	-3.148	22	.005*
Three-member cluster	Three-consonant onsets pre-test & post-test	-.792	.932	.190	-1.185	-.398	-4.163	23	.000*
	Three-consonant coda pre-test & post-test	-.583	.881	.180	-.955	-.212	-3.245	23	.004*
Silent singletons	Initial silent singletons pre-test & post-test	-1.611	1.092	.257	-2.154	-1.068	-6.259	17	.000*
	Mid/final silent singletons pre-test & post-test	-.739	1.054	.220	-1.195	-.283	-3.364	22	.003*
Digraph singletons	Initial digraph pre-test & post-test	-.500	.598	.127	-.765	-.235	-3.924	21	.001*
	Final digraph pre-test & post-test	-.636	.953	.203	-1.059	-.214	-3.130	21	.005*
Digraphs in clusters	Cluster + digraph pre-test & post-test	-1.000	.674	.141	-1.292	-.708	-7.113	22	.000*

5.3.4.1.3 Listening-only group

The paired sample t-test analysis for the data of the listening-only group generated the results in Table 5.32 which revealed a statistically significant improvement ($p \leq 0.05$) on the reading aloud task on only three test token types. These are two-consonant onsets $p = 0.029$, three-consonant onsets $p = 0.045$ and initial digraph singletons $p = 0.005$. There was no significant improvement in the results of the other six token types as follows, two consonant codas $p = 0.090$, three consonant codas $p = 0.162$, initial silent singletons $p = 0.090$, mid/final silent singletons $p = 0.137$, final digraph singletons $p = 0.257$, and digraph clusters $p = 0.071$. These results show that as with the traditional teaching method, the listening-only method was not a better instruction method compared to the listening + orthography method because it did not yield significant improvement on most of the test token types on the reading aloud task. the variations of the scores between pre-test and post-test for the traditional teaching method group and the listening-only group was 3.31 and 3.26 points respectively compared to the listening + orthography group with 6.69 points.

Table 5.32 LIST all group reading aloud task pre-test vs post-test in the test token types

Test token types		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. D	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Two-member cluster	Two-consonant onsets pre-test & post-test	-.381	.740	.161	-.718	-.044	-2.359	20	.029*
	Two-consonant coda pre-test - & post-test	-.304	.822	.171	-.660	.051	-1.775	22	.090
Three-member cluster	Three-consonant onsets pre-test & post-test	-.609	1.373	.286	-1.202	-.015	-2.126	22	.045*
	Three-consonant coda pre-test & post-test	-.174	.576	.120	-.423	.075	-1.447	22	.162
Silent singletons	Initial silent singletons pre-test & post-test	-.304	.822	.171	-.660	.051	-1.775	22	.090
	Mid/final silent singletons pre-test & post-test	-.261	.810	.169	-.611	.089	-1.545	22	.137
Digraph singletons	Initial digraph pre-test & post-test	-.455	.671	.143	-.752	-.157	-3.177	21	.005*
	Final digraph pre-test & post-test	-.174	.717	.149	-.484	.136	-1.164	22	.257
Digraph clusters	Cluster + digraph pre-test & post-test	-.391	.988	.206	-.819	.036	-1.899	22	.071

In sum, when comparing the results of the traditional teaching method group with that of the listening + orthography group who both had orthographic input during instruction, the listening + orthography group that had phonological input by listening to recordings of the instruction stimuli made by an English NS improved better than the traditional teaching method group who were taught the same instruction stimuli by a non-native speaking English teacher. On the other hand, when comparing the results of the listening + orthography group with that of the listening-only group who both had the same English native speaker phonological input via listening to audio tape recordings but had no orthographic input, the effect of orthographic input could also be seen as playing a role in the listening + orthography group's performance on the reading aloud task. This means that using the listening + orthography method suggests to be a better instruction method. This was also seen in the variations in the percentages of correct scores of the groups in Table 5.29 which show the higher variation of correct scores obtained by the listening + orthography group on all the nine test token types.

To wrap up this section, there was combined significant improvement revealed by the groups by the effect of instruction, but a comparison with the three groups shows that the listening + orthography group improved significantly better when compared to the traditional teaching method group or the listening-only group. This was seen in the dictation elicited production task, elicited oral production in picture-naming task and in reading aloud task as revealed in the

above sections on the effect of instruction. Although the traditional teaching method group yielded more improvement when compared to the listening + orthography group and the listening-only group on the epenthesis task, the difference between their mean scores with that of the listening + orthography group was not significantly different (difference of 0.22 points). Figure 5.5 shows the overall summary of the scores for both production and perception tasks.

Figure 5.5 Summary of experimental condition groups' mean scores by the effect of instruction

In the following section, the results by proficiency level are presented to check if this influenced their performance on the tasks.

5.4 Results by proficiency level

As mentioned in section 4.3.5.3, as a means of confirming the proficiency level of the participants before administering the pre-test, a proficiency level test was conducted using the Oxford Quick Placement Test (OQPT) part A (questions 1-40). The participants' proficiency level was determined by the scores they obtained in the test (see Table 4.3 on OQPT possible scores). In addition, apart from using the proficiency level test scores to confirm the participants' proficiency level; this was employed to test **H1.5** which states that;

H1.5 - Learners with higher proficiency level will improve more in all experimental condition groups.

The repeated measures ANOVA results are presented task by task according to how they were administered (just as it was presented in the results by the effect of instruction). A descriptive

statistical analysis was first conducted to show the frequency and percentages of the distribution of proficiency levels of the whole study sample of 73 participants as shown in Table 5.33.

Table 5.33 Proficiency level descriptive statistics of the 73 participants

Proficiency level	Frequency	Percent	Cumulative frequency
Beginner	17	23.3	23.3
Breakthrough	41	56.2	79.5
Elementary	15	20.5	100.0

Based on the description of the possible OQPT scores given in Table 4.3, the proficiency level of the participants in Table 5.33 include beginner-level, breakthrough-level and elementary-level. The table shows that 17 participants were beginner-level learners (23.3%) with a score range of 0-9 out of 40 marks, while 15 participants were elementary-level learners (20.5%) with a score range of 16-23 out of 40 marks. The remaining 41 participants constituting over half of the population of the total participants were breakthrough learners (56.2%) with a score range of 10-15 out of 40 marks.

Having obtained the frequencies and percentages for all the participants, a descriptive statistical analysis was conducted to show the proficiency levels of the participants within each group[29] in order to see if the groups were comparable before the four week treatment as shown in descriptive statistics in Table 5.34 for traditional teaching group, Table 5.35 for listening + orthography group and Table 5.36 for listening-only group.

[29] The differences between the numbers of proficiency levels in the groups could have happened by chance because based on the procedure used for putting the participants into the different experimental condition groups as discussed in section 4.3.1, the participants' proficiency levels was not considered as a criteria for grouping them into conditions. They were randomly divided using balloting whereby the numbers 1, 2 and 3 were written on slips of paper and crumpled to hide the numbers. The participants then picked a slip which then became their experimental condition group.

Table 5.34 TTM group proficiency level descriptive statistics

Proficiency level	Frequency	Percent	Cumulative frequency
Beginner	5	19.2	19.2
Breakthrough	13	50.0	69.2
Elementary	8	30.8	100.0

Table 5.35 LIST + ORTH group proficiency level descriptive statistics

Proficiency level	Frequency	Percent	Cumulative frequency
Beginner	7	29.2	29.2
Breakthrough	14	58.3	87.5
Elementary	3	12.5	100.0

Table 5.36 LIST group proficiency level descriptive statistics

Proficiency level	Frequency	Percent	Cumulative frequency
Beginner	5	21.7	21.7
Breakthrough	14	60.9	82.6
Elementary	4	17.4	100.0

The frequencies and percentages of the experimental condition groups' proficiency levels show that for the traditional teaching method group with 26 participants in Table 5.34, 13 participants (50%) were breakthrough-level learners, eight participants (30.8%) were elementary-level learners and the remaining five participants (19.2%) were beginner-level learners. As for the listening + orthography group in Table 5.35 with 24 participants, there were seven beginner-level learners (29.2%) while only three participants were elementary-level learners (12.5%). There were 14 breakthrough-level learners in the listening + orthography group (58.3%). The frequencies and percentages of listening-only group is not very far from that of listening + orthography group. Table 5.36 shows the descriptive statistics of the 23 participants in listening-only group. There were 14 breakthrough-level learners just like in the listening + orthography group constituting 60.9% of the total participants in the group. Five participants were beginner-level learners (21.7%) and four participants were elementary-level learners (17.4%). The frequencies of the three experimental condition group shows approximately similar number of beginner-level and breakthrough-level learners but there were more elementary-level learners in the traditional teaching method group.

Upon doing the descriptive statistics and confirming the different proficiency levels of the participants within the experimental condition groups, a normality test was conducted based on the proficiency levels of the experimental condition groups. This is in order to check whether the assumption that the data of the dependent variables are approximately normally distributed among the groups within the independent variables. In the following sections 5.4.1 to 5.4.4, the results by proficiency levels are presented on the four task according to the different experimental condition groups.

5.4.1 Results by proficiency level on the epenthesis perception task

As seen in section 5.3.1 that the results of the epenthesis task revealed statistically significant improvement ($p \leq 0.05$) between pre-test and post-test by the combined experimental condition groups, but there was no significant interaction effect with condition ($p = 0.561$) and ($F = 0.582$). There was also no significant difference between the groups as based on Bonferroni test ($p > 0.05$). In this section, a repeated measures ANOVA analysis was conducted using proficiency level as the independent variable and the dependent variables were pre-test and post-test in epenthesis task.

5.4.1.1 Traditional teaching method group epenthesis task

Box plot visual inspection for the assumption of normal distribution of data was conducted for the data of the 26 participants in the traditional teaching method group to check whether the independent variable (proficiency level) was approximately normally distributed within the dependent variables (epenthesis task pre-test and post-test). Entry 9 from the elementary-level was detected as an outlier with a particularly low score in the pre-test. Although no outlier was detected in the post-test, the data of entry 9 was excluded from the analyses because the data for both time '1' and time '2' were needed for the repeated measures ANOVA analysis (see appendix J.1 for the pre-test and post-test box plots).

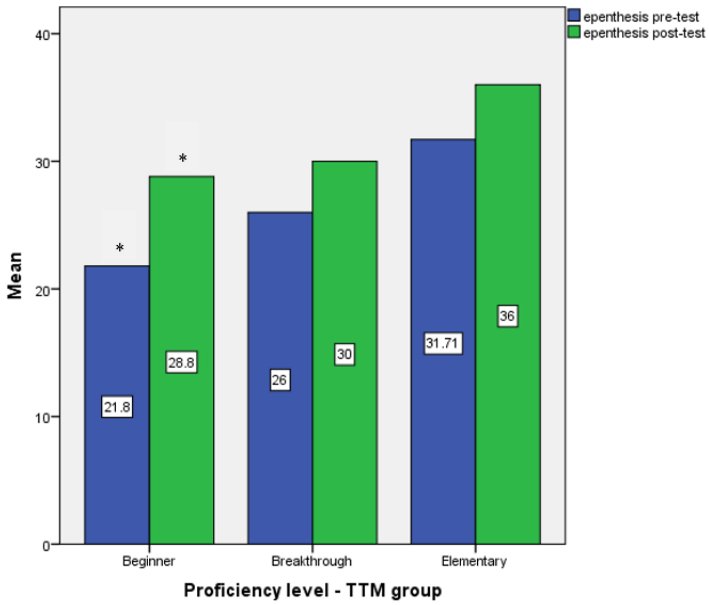


Figure 5.6 TTM group epenthesis task by proficiency level

The repeated measures ANOVA was conducted to determine whether there was statistically significant improvement between pre-test and post-test of epenthesis task based on the proficiency level of the group, and to check for group interaction and effect size.

The repeated measures ANOVA results of traditional teaching method group (which had more elementary-level learners than both the listening + orthography and listening-only groups) presented in Table 5.37 revealed a statistically significant improvement ($p \leq 0.05$) obtained by the combined proficiency levels in the traditional teaching method group ($p \leq 0.001$). However, post-hoc comparison using Bonferroni adjustment shown in Table 5.38 indicated that the scores between the beginner-level learners, breakthrough-level learners, and elementary-level learners of the traditional teaching method group was not statistically significant ($p > 0.5$). The results in Table 5.37 yielded a non-statistically significant interaction effect ($p = 0.534$) and ($F = 0.646$). The partial eta squared effect size stood at ($\eta p^2 = 0.055$) indicating a small effect size of 5.5% of the improvement by the time of measurement at pre-test and post-test by the proficiency level. These results suggests that although there was significant main effect improvement by the combined traditional teaching method group, but there was no significant relationship between pre-test and post-test epenthesis with proficiency level.

Table 5.37 Repeated measures ANOVA table of TTM group by proficiency level on the epenthesis task: Tests of Within-Subjects Effects

Source		F	Sig.	Partial Eta Squared
pre & post epenthesis	Sphericity Assumed	21.134	.000*	.490
	Greenhouse-Geisser	21.134	.000	.490
	Huynh-Feldt	21.134	.000	.490
	Lower-bound	21.134	.000	.490
pre & post epenthesis * proflev	Sphericity Assumed	.646	.534	.055
	Greenhouse-Geisser	.646	.534	.055
	Huynh-Feldt	.646	.534	.055
	Lower-bound	.646	.534	.055

Table 5.38 Post-hoc table of TTM group epenthesis task by proficiency level

(I) Proficiency level - TTM group	(J) Proficiency level - TTM group	Mean Difference (I-J)	Std. Error	Sig.[a]
Beginner	Breakthrough	-2.700	3.274	1.000
	Elementary	-8.557	3.643	.085
Breakthrough	Beginner	2.700	3.274	1.000
	Elementary	-5.857	2.917	.171
Elementary	Beginner	8.557	3.643	.085
	Breakthrough	5.857	2.917	.171

Based on estimated marginal means

a. Adjustment for multiple comparisons: Bonferroni.

The mean scores of the traditional teaching method group in Figure 5.6 revealed the performance of the participants at pre-test and post-test showing the difference in the scores

obtained by the groups based on their proficiency levels. The beginner-level learners improved significantly between pre-test and post-test (with a mean difference of 7 points). The differences in the scores of the elementary-level and breakthrough-level learners did not significantly differ (see appendix L.1 for table of mean scores).

5.4.1.2 Listening + orthography group epenthesis task

Box plot visual inspection for the assumption of normal distribution of data was conducted for the data of the 24 participants in the listening + orthography group. Box plot of epenthesis pre-test did not reveal any outlier, but two outliers were detected in the box plot of epenthesis post-test (see pre-test and post-test box plots in appendix J.2). Entry 16 from the beginner-level had a particularly low score while entry 14 also from the beginner-level had a particularly high score. In order to ensure the assumption that the data was approximately normally distributed, their data were excluded from the analysis before conducting the repeated measures ANOVA.

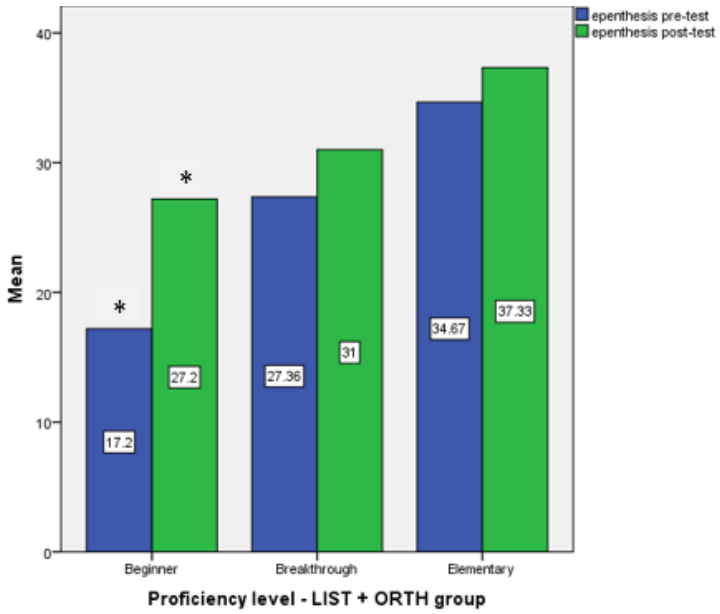


Figure 5.7 LIST + ORTH group epenthesis task results by proficiency level

The results of the repeated measures ANOVA analysis presented in Table 5.39 show a statistically significant (i.e. $p \leq .05$) improvement obtained by the listening + orthography group between epenthesis pre-test and post-test ($p = 0.003$). Post-hoc comparison using Bonferroni adjustment as shown in Table 5.40 shows that the scores between the beginner-level learners and the breakthrough-level learners was statistically significant ($p = 0.047$), same as the scores between the beginner-level learners and the elementary-level learners ($p = 004$). There was no significant difference between the scores of the breakthrough-level and the elementary-level learners ($p = 0.140$). In Table 5.39, pre-test and post-test epenthesis task by proficiency level

interaction by the different proficiency levels did not yield statistically significant improvement (p = 0.205) and (F = 1.727) with partial eta squared effect size (ηp^2 = 0.154). This means that 15.4% of the improvement by proficiency level is accounted for by the time period it was measured at pre-test and post-test indicating a large effect size. These results suggest that although there was improvement between epenthesis pre-test and post-test by all the proficiency levels in the listening + orthography group combined, there was however no relationship between epenthesis pre-test and post-test by proficiency level. The mean scores shown in Figure 5.7 show the groups' scores partitioned across pre-test and post-test (excluding the results of the two outliers from the beginner level). The beginner level learners had better improved mean scores between pre-test and post-test epenthesis task (see difference in scores in appendix L.2. Although there was variation in the mean scores of the different groups between pre-test and post-test but there was no significant interaction (p = 0.205). The result of the listening + orthography by proficiency level do not support **H1.5** on the epenthesis task because the beginner-level learners (lower proficiency level based on OQPT scores) improved more on the epenthesis task.

Table 5.39 Repeated measures ANOVA table of LIST + ORTH group by proficiency level on the epenthesis task: Tests of Within-Subjects Effect

Source		F	Sig.	Partial Eta Squared
pre & post epenthesis	Sphericity Assumed	11.631	.003	.380
	Greenhouse-Geisser	11.631	.003	.380
	Huynh-Feldt	11.631	.003	.380
	Lower-bound	11.631	.003	.380
pre & post epenthesis * proflev	Sphericity Assumed	1.727	.205	.154
	Greenhouse-Geisser	1.727	.205	.154
	Huynh-Feldt	1.727	.205	.154
	Lower-bound	1.727	.205	.154

Table 5.40 Post-hoc table of LIST + ORTH group epenthesis task by proficiency level

(I) Proficiency level - LIST + ORTH group	(J) Proficiency level - LIST + ORTH group	Mean Difference (I-J)	Std. Error	Sig.b
Beginner	Breakthrough	-6.979*	2.627	.047*
	Elementary	-13.800*	3.682	.004*
Breakthrough	Beginner	6.979*	2.627	.047*
	Elementary	-6.821	3.208	.140
Elementary	Beginner	13.800*	3.682	.004*
	Breakthrough	6.821	3.208	.140

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

5.4.1.3 Listening-only group epenthesis task

The same method used in the analyses of the traditional teaching method and listening + orthography groups was used for the analyses of the listening-only group. Box plot visual assessment was conducted for the data of the 23 participants in the group. The box plot of epenthesis pre-test did not reveal any outliers, similarly the box plot of epenthesis post-test in appendix J.3. This suggests the assumption that the data was approximately normally distributed among the 23 participants in the listening-only group and so no data was excluded from the analyses. A repeated measures ANOVA analysis was conducted to check for statistically significant improvement, group interaction and effect size between pre-test and post-test by the proficiency levels as shown in Table 5.41 and Table 5.42 respectively.

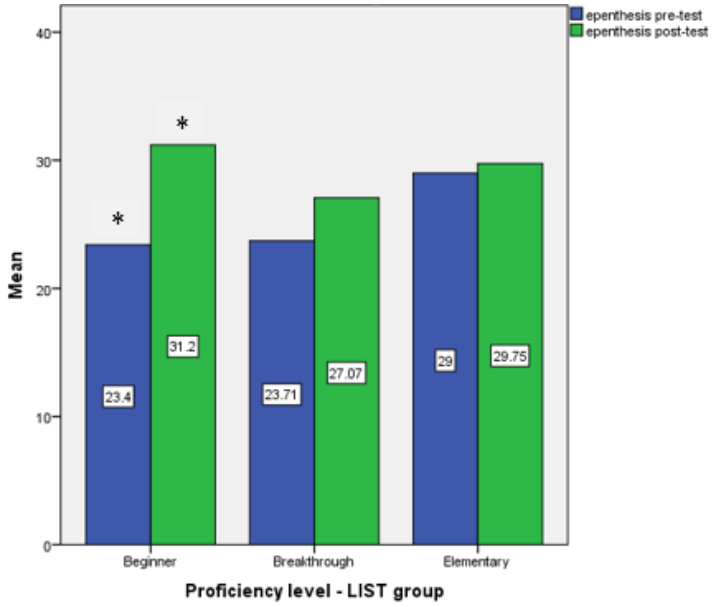


Figure 5.8 LIST group epenthesis task by proficiency level

The results of the repeated measures ANOVA analysis in Table 5.41 revealed a statistically significant improvement by the combined listening-only group between pre-test and post-test (p = 0.004). Even though post-hoc comparison using Bonferroni adjustment as shown in Table 5.42 revealed that the scores between the beginner-level learners, breakthrough-level learners, and elementary-level learners of the listening only group was not statistically significant (p > 0.5)

Table 5.41 Repeated measures ANOVA table of LIST group proficiency level epenthesis task: Tests of Within-Subjects Effect

Source		F	Sig.	Partial Eta Squared
pre & post epenthesis	Sphericity Assumed	10.947	.004	.354
	Greenhouse-Geisser	10.947	.004	.354
	Huynh-Feldt	10.947	.004	.354
	Lower-bound	10.947	.004	.354
pre & post epenthesis * proflev	Sphericity Assumed	2.413	.115	.194
	Greenhouse-Geisser	2.413	.115	.194
	Huynh-Feldt	2.413	.115	.194
	Lower-bound	2.413	.115	.194

Table 5.42 Post-hoc table of LIST group epenthesis task by proficiency level

(I) Proficiency level - LIST group	(J) Proficiency level - LIST group	Mean Difference (I-J)	Std. Error	Sig.[a]
Beginner	Breakthrough	1.907	4.485	1.000
	Elementary	-2.075	5.775	1.000
Breakthrough	Beginner	-1.907	4.485	1.000
	Elementary	-3.982	4.880	1.000
Elementary	Beginner	2.075	5.775	1.000
	Breakthrough	3.982	4.880	1.000

Based on estimated marginal means
a. Adjustment for multiple comparisons: Bonferroni.

There was significant interaction effect was found (p = 0.115) and (F = 2.413). Partial eta squared effect size stood at (ηp^2 = 0.194) indicating a large effect size of 19.4%. The results suggest that although the participants in the listening-only group combined improved on the epenthesis task, there was no relationship with their performance based on their proficiency level. The mean scores of the different proficiency levels of the listening-only group on the epenthesis task in Figure 5.8 show not much difference between pre-test and post-test of elementary-level learners (mean difference of 0.75). A slightly more improved difference is seen between the breakthrough-level learners and a greater improvement was seen in the mean scores of the beginner-level learners (mean difference of 7.8). Here also like with the traditional teaching method and the listening + orthography method, the results do not support **H1.5** which predicts greater improvement by learners with higher proficiency level for all experimental condition groups. The beginner-level learners improved significantly more than the breakthrough-level and elementary level learners in all the experimental condition groups between pre-test and post-test on the epenthesis task as shown in the summary of their mean scores in Figure 5.9 (see appendix L.3 for the variation between pre-test and post-test mean scores of the groups).

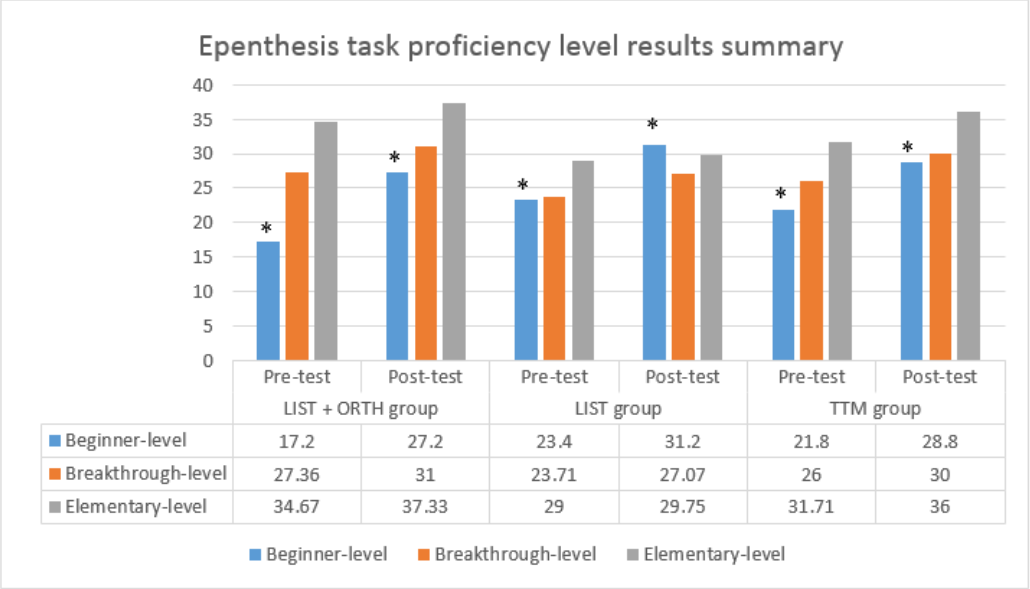


Figure 5.9 summary of the mean scores by proficiency level of the groups on the epenthesis task

5.4.2 Results by proficiency level on the dictation elicited written production task

The dictation task results by effect of instruction revealed a statistically significant improvement $p \leq 0.05$ and a significant interaction effect by the combined groups ($p = 0.043$) and ($F = 3.293$) in section 5.3.2. This section presents the results by proficiency levels generated from repeated measures ANOVA analysis.

5.4.2.1 Traditional teaching method group dictation

A normality test was conducted to check the assumption of normal distribution of the data of the traditional teaching method group's dictation task as required for a parametric study. The box plots of the traditional teaching method group both in pre-test and post-test did not reveal any outliers therefore no data was excluded from the analysis (see appendix J.4 for the box plots).

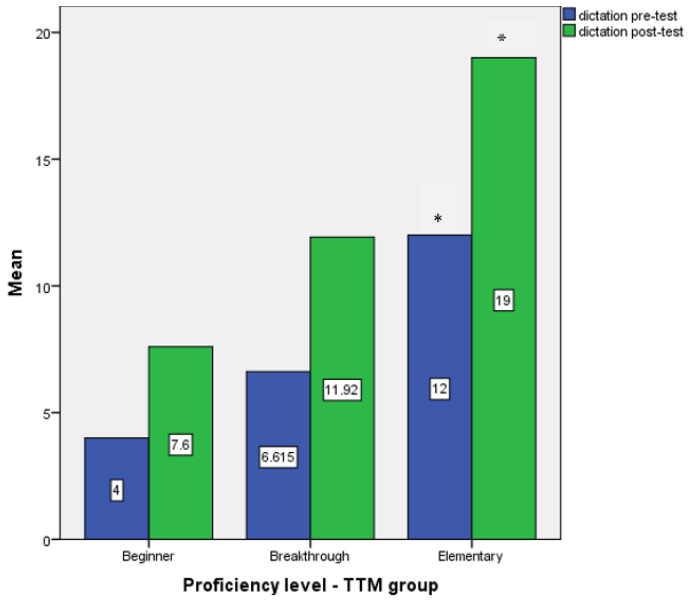


Figure 5.10 TTM group dictation task by proficiency levels

The repeated measures ANOVA results in Table 5.43 revealed a statistically significant difference between pre-test and post-test by the traditional teaching method group combined (p = 0.001). Post-hoc comparison using Bonferroni test as shown in Table 5.44 indicated that for the traditional teaching method group, the scores between the beginner-level learners and the elementary-level learners was significant (p = 0.055). Whereas the scores between the beginner-level learners vs the breakthrough-level learners, and the elementary-level learners vs the breakthrough-level learners was not statistically significant (p > 0.5)

Table 5.43 Repeated measures ANOVA table of TTM group by proficiency level on the dictation task: Tests of Within-Subjects Effect

Source		F	Sig.	Partial Eta Squared
pre & post dictation	Sphericity Assumed	31.620	.000	.579
	Greenhouse-Geisser	31.620	.000	.579
	Huynh-Feldt	31.620	.000	.579
	Lower-bound	31.620	.000	.579
pre & post dictation * proflev	Sphericity Assumed	.917	.414	.074
	Greenhouse-Geisser	.917	.414	.074
	Huynh-Feldt	.917	.414	.074
	Lower-bound	.917	.414	.074

Table 5.44 Post-hoc table of TTM group dictation task by proficiency level

(I) Proficiency level - TTM group	(J) Proficiency level - TTM group	Mean Difference (I-J)	Std. Error	Sig.[a]
Beginner	Breakthrough	-3.469	3.529	1.000
	Elementary	-9.700	3.823	.055*
Breakthrough	Beginner	3.469	3.529	1.000
	Elementary	-6.231	3.013	.150
Elementary	Beginner	9.700	3.823	.055*
	Breakthrough	6.231	3.013	.150

Based on estimated marginal means
a. Adjustment for multiple comparisons: Bonferroni.

A non-significant interaction by proficiency level in the traditional teaching method group is revealed in the repeated measures ANOVA test in Table 5.43 (p = 0.414) and (F = 0.917) with partial eta effect size (ηp^2 = 0.074). This means that 7.4% (a medium effect size) of the improvement by the group's proficiency levels can be accounted for by the time period of the test measurement at time '1' and time '2'. Figure 5.11 shows the variation between the mean scores of the traditional teaching method group at pre-test and post-test, which indicates a general increase in the means of the different proficiency levels between pre-test and post-test (see appendix L.4 for the mean scores table). The elementary-level learners improved significantly when compared to the beginner-level and breakthrough-level learners, which supports the prediction in **H1.5**.

5.4.2.2 Listening + orthography group dictation task

Box plot visual assessment of the 24 participants in the listening + orthography group on the dictation task revealed no outliers in either pre-test or post-test (see appendix J.5). Therefore no data was excluded from the repeated measures ANOVA analysis.

The repeated measures ANOVA results presented in Table 5.45 revealed a statistically significant improvement ($p \leq 0.05$) between pre-test and post-test obtained by the listening + orthography group on the dictation task (p = 0.001). Post-hoc comparison using Bonferroni adjustment in Table 5.46 revealed a statistically significant difference between the scores of the breakthrough-level learners and the elementary-level learners (p = 0.041). There was no significant difference between the scores of the beginner-level learners vs the breakthrough-level learners and the beginner-level learners vs the elementary level learners ($p > 0.05$).

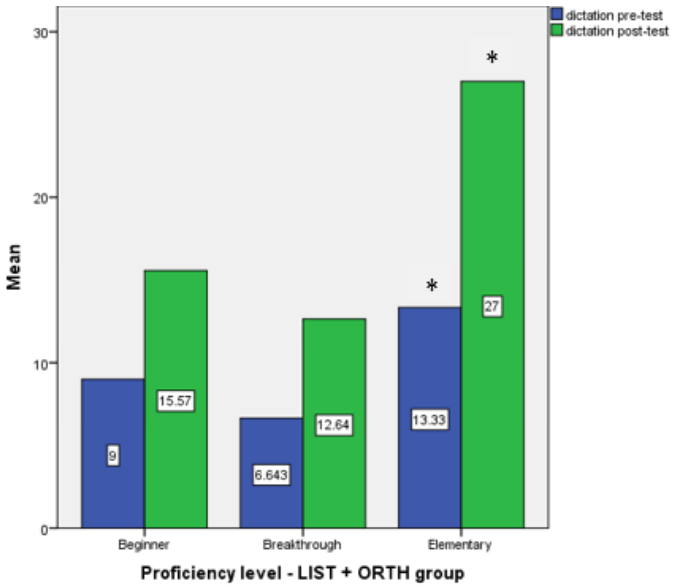


Figure 5.11 LIST + ORTH group dictation task by proficiency levels

Table 5.45 Repeated measures ANOVA table of LIST + ORTH group by proficiency level on the dictation task: Tests of Within-Subjects Effect

Source		F	Sig.	Partial Eta Squared
pre & post dictation	Sphericity Assumed	164.609	.000	.887
	Greenhouse-Geisser	164.609	.000	.887
	Huynh-Feldt	164.609	.000	.887
	Lower-bound	164.609	.000	.887
pre & post dictation * proflev	Sphericity Assumed	9.705	.001	.480
	Greenhouse-Geisser	9.705	.001	.480
	Huynh-Feldt	9.705	.001	.480
	Lower-bound	9.705	.001	.480

Table 5.46 Post-hoc table of LIST + ORTH group dictation task by proficiency level

(I) Proficiency level - LIST + ORTH group	(J) Proficiency level - LIST + ORTH group	Mean Difference (I-J)	Std. Error	Sig.[b]
Beginner	Breakthrough	2.643	2.845	1.000
	Elementary	-7.881	4.241	.232
Breakthrough	Beginner	-2.643	2.845	1.000
	Elementary	-10.524*	3.910	.041*
Elementary	Beginner	7.881	4.241	.232
	Breakthrough	10.524*	3.910	.041

Based on estimated marginal means
*. The mean difference is significant at the .05 level.
b. Adjustment for multiple comparisons: Bonferroni.

There was statistically significant interaction revealed in Table 5.45 by the different groups of the independent variable (p = 0.001) and (F = 9.705) with partial eta squared effect size (ηp^2 =0.480) indicating 48% of the improvement by proficiency level, a large effect size. The results suggest that aside from the combined improvement on the dictation task between time '1' and time '2' by the listening + orthography group, there was also a significant relationship in performance by the different proficiency levels in the listening + orthography group indicating

how much the differences in the scores was affected by the different proficiency levels of the participants (see appendix L.5 for the variation in the listening + orthography group's mean scores for the different proficiency levels).

The bar chart in Figure 5.11 shows the mean scores of the listening + orthography group and it reveals that there was improvement for all the proficiency levels in the post-test mean scores at the end of the four weeks of instruction. The greatest increase was by the elementary-level learners with 13.67 points. On the other hand, the beginner-level and breakthrough-level learners had a similar mean score difference between pre-test and post-test (6.57 and 6 points respectively). The results of the dictation task support **H1.5**, which predicted an improvement by the higher proficiency level (the elementary-level based on the OQPT scores) learners.

5.4.2.3 Listening-only group dictation task

Box plots of the listening-only group were produced and the output for the pre-test revealed entry 13 from the beginner-level as an outlier with a particularly high score, and at post-test the same entry 13 was detected as an extreme outlier with extremely high score. The data of entry 13 was therefore excluded from the repeated measures ANOVA analysis (see appendix J.6 for the box plots).

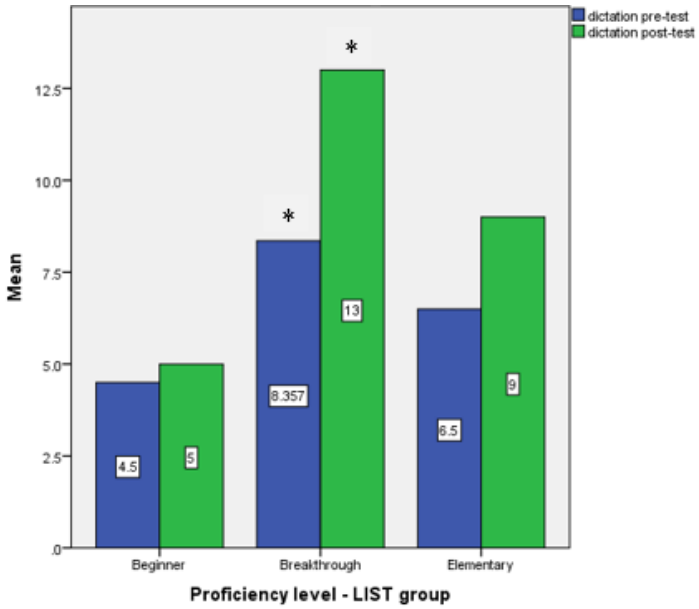


Figure 5.12 LIST group dictation task by proficiency levels

The repeated measures ANOVA results in Table 5.47 show a statistically significant improvement obtained by the listening-only group combined from pre-test to post-test on the dictation task (p = 0.050). Post-hoc comparison using Bonferroni adjustment as shown in Table

5.48 revealed that the scores between the three proficiency levels of the listening only group was not statistically significant ($p > 0.5$)

Table 5.47 Repeated measures ANOVA table of the LIST group by proficiency level dictation task: Tests of Within-Subjects Effects

Source		F	Sig.	Partial Eta Squared
pre & post dictation	Sphericity Assumed	4.382	.050	.187
	Greenhouse-Geisser	4.382	.050	.187
	Huynh-Feldt	4.382	.050	.187
	Lower-bound	4.382	.050	.187
pre & post dictation * proflev	Sphericity Assumed	1.249	.309	.116
	Greenhouse-Geisser	1.249	.309	.116
	Huynh-Feldt	1.249	.309	.116
	Lower-bound	1.249	.309	.116

Table 5.48 Post-hoc table of LIST group dictation task by proficiency level

(I) Proficiency level - LIST group	(J) Proficiency level - LIST group	Mean Difference (I-J)	Std. Error	Sig.[a]
Beginner	Breakthrough	-5.929	3.639	.359
	Elementary	-3.000	4.539	1.000
Breakthrough	Beginner	5.929	3.639	.359
	Elementary	2.929	3.639	1.000
Elementary	Beginner	3.000	4.539	1.000
	Breakthrough	-2.929	3.639	1.000

Based on estimated marginal means
a. Adjustment for multiple comparisons: Bonferroni.

There was not a significant interaction effect ($p > 0.05$) by the listening-only group by proficiency levels on the dictation task as shown in Table 5.47 ($p = 0.309$) and ($F = 1.249$). The partial eta squared effect size stood at ($\eta p^2 = 0.116$) indicating that 11.6% (a medium effect size) of the improvement by proficiency level can be accounted for by the time of measurement at pre-test and post-test. The results demonstrate no significant relationship by proficiency level of the listening-only group despite their combined significant improvement on the dictation task. Figure 5.12 shows the differences in mean scores between pre-test and post-test which revealed a greater improvement by the breakthrough-level learners (see appendix L.6 for the mean scores and differences of the listening-only group). Contrary to the results of the traditional teaching method group and the listening + orthography group which support the hypothesis for proficiency level, the results of the listening-only group do not fully support **H1.5**. The breakthrough-level learners improved more than the elementary-level learners as shown in the summary bar chart in Figure 5.13.

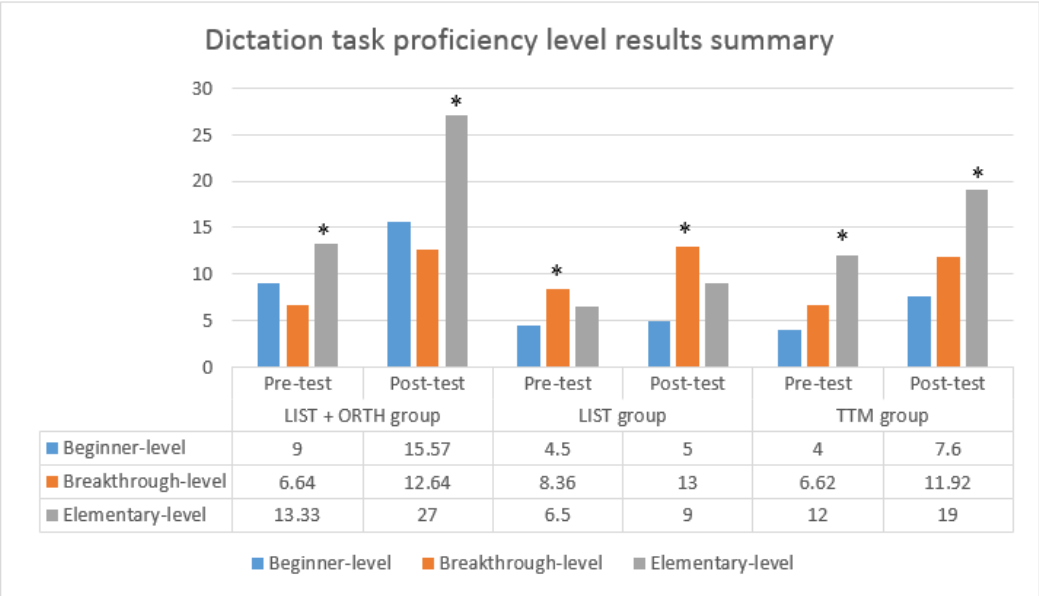


Figure 5.13 Summary of the mean scores by proficiency levels of the groups on the dictation task

In the following sections, the results of production tasks in elicited oral production in picture-naming and reading aloud are presented beginning with picture-naming task.

5.4.3 Results by proficiency level on the elicited oral production picture-naming task

In the previous sections, the results of the perception tasks in epenthesis and dictation were presented. In this section and in the subsequent one, results of the oral production task in picture-naming and reading aloud are presented.

5.4.3.1 Traditional teaching method group picture-naming task

Box plot visual inspection was conducted for the data of the traditional teaching method group on the picture-naming task. There was no outlier revealed in the pre-test box plot. Five outliers were revealed from the breakthrough-level in the post-test box plot. Entries 10 and 24 had particularly high scores and entry 11 had an extremely high score, while entries 1 and 25 had extremely low scores. Therefore their data were excluded from the repeated measures ANOVA analysis (see appendix J.7 for the pre-test and post-test box plots).

A repeated measures ANOVA was conducted to see if there was statistically significant difference between the traditional teaching method group's pre-test and post-test on the picture-naming task. The results in Table 5.49 show a statistically significant ($p \leq .05$) improvement by the different proficiency levels combined in the traditional teaching method group between pre-test and post-test ($p = 0.001$).

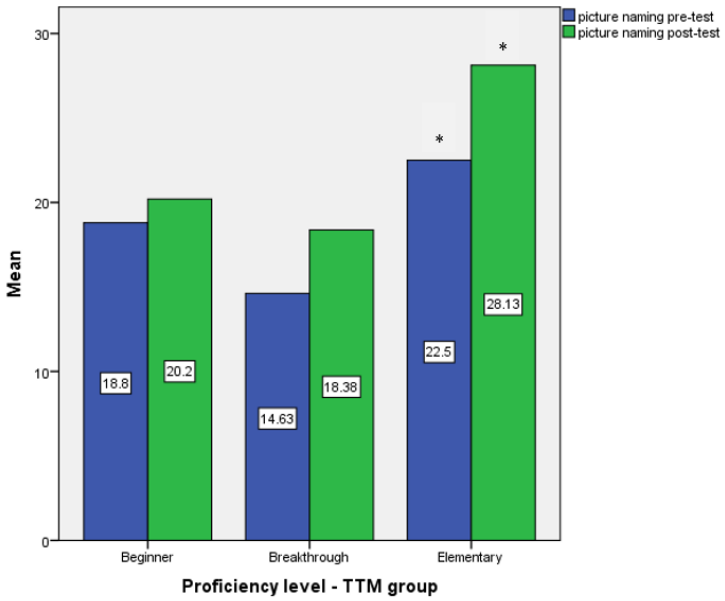


Figure 5.14 TTM group picture-naming task by proficiency levels

Table 5.49 Repeated measures ANOVA table of TTM group by proficiency level on the picture-naming task: Tests of Within-Subjects Effect

Source		F	Sig.	Partial Eta Squared
pre & post picture naming	Sphericity Assumed	17.291	.001	.490
	Greenhouse-Geisser	17.291	.001	.490
	Huynh-Feldt	17.291	.001	.490
	Lower-bound	17.291	.001	.490
pre & post picture naming * proflev	Sphericity Assumed	1.851	.186	.171
	Greenhouse-Geisser	1.851	.186	.171
	Huynh-Feldt	1.851	.186	.171
	Lower-bound	1.851	.186	.171

Post-hoc comparison using Bonferroni adjustment shown in Table 5.50 indicated that for the scores between the breakthrough-level learners and the elementary-level learners was significant ($p = 0.002$). There was no significant difference between the scores of the beginner-level learners vs the breakthrough-level learners, and the elementary-level learners vs the beginner level learners, ($p > 0.05$).

Table 5.50 Post-hoc table of TTM group picture-naming task by proficiency level

(I) Proficiency level - TTM group	(J) Proficiency level - TTM group	Mean Difference (I-J)	Std. Error	Sig.[b]
Beginner	Breakthrough	3.000	2.478	.725
	Elementary	-5.812	2.478	.092
Breakthrough	Beginner	-3.000	2.478	.725
	Elementary	-8.812*	2.173	.002*
Elementary	Beginner	5.812	2.478	.092
	Breakthrough	8.812*	2.173	.002*

Based on estimated marginal means
*. The mean difference is significant at the .05 level.
b. Adjustment for multiple comparisons: Bonferroni.

On the other hand, the results in Table 5.49 did not yield a significant interaction effect (p = 0.186) and (F = 1.851) with partial eta squared (ηp^2 = 0.171) indicating 17.1% of the improvement by the proficiency levels of the traditional teaching method group on the picture-naming task. The bar chart of the mean scores of the traditional teaching method group in Figure 5.14 shows that the elementary-level learners performed significantly better (difference of 5.63 points) than the breakthrough-level learners and the least performance (difference of 1.4 points) was by the beginner-level learners (see appendix L.7 for the table of mean scores and differences). Therefore the results of the traditional teaching method group on the picture-naming task support the prediction in **H1.5**.

5.4.3.2 Listening + orthography group picture-naming task

The box-plot visual assessment for normality assumption was conducted and entry 12 from the beginner-level was detected as an outlier with particularly high score in the pre-test. There were no outliers detected in the post-test (see pre-test and post-test box plots in appendix J.8). The data of entry 12 was excluded from the analysis as both time '1' and time '2' data were needed for the repeated measures ANOVA analysis. The independent variable as in the previous tests conducted is proficiency level with the tests of picture-naming as the dependent variable.

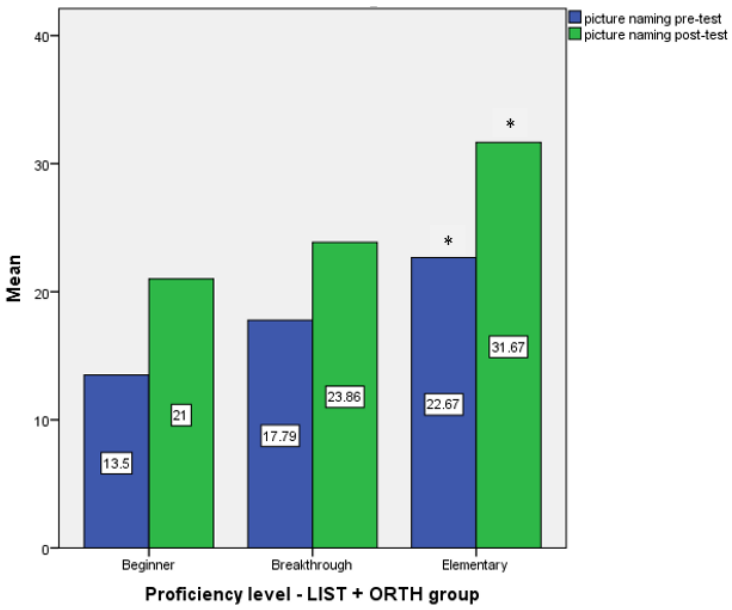


Figure 5.15 LIST + ORTH group picture-naming task by proficiency level

The repeated measures ANOVA results presented in Table 5.51 show a statistically significant ($p \leq .05$) improvement obtained by the listening + orthography group all levels combined between picture-naming pre-test and post-test ($p = 0.001$). Post-hoc comparison using Bonferroni adjustment as shown in Table 5.52 revealed a statistically significant difference between the scores of the beginner-level learners and the elementary-level learners ($p = 0.011$). There was no significant difference between the scores of the beginner-level learners vs the breakthrough-level learners ($p = 0.306$), and the breakthrough-level learners vs the elementary level learners ($p = 0.090$),

Table 5.51 Repeated measures ANOVA table of LIST + ORTH group by proficiency level on the picture-naming task: Tests of Within-Subjects Effect

Source		F	Sig.	Partial Eta Squared
pre & post picture naming	Sphericity Assumed	38.230	.000	.657
	Greenhouse-Geisser	38.230	.000	.657
	Huynh-Feldt	38.230	.000	.657
	Lower-bound	38.230	.000	.657
pre & post picture naming * proflev	Sphericity Assumed	.533	.595	.051
	Greenhouse-Geisser	.533	.595	.051
	Huynh-Feldt	.533	.595	.051
	Lower-bound	.533	.595	.051

Table 5.52 Post-hoc table of LIST + ORTH group picture-naming task by proficiency level

(I) Proficiency level - LIST + ORTH group	(J) Proficiency level - LIST + ORTH group	Mean Difference (I-J)	Std. Error	Sig.[b]
Beginner	Breakthrough	-3.571	2.084	.306
	Elementary	-9.917*	3.020	.011*
Breakthrough	Beginner	3.571	2.084	.306
	Elementary	-6.345	2.717	.090
Elementary	Beginner	9.917*	3.020	.011*
	Breakthrough	6.345	2.717	.090

Based on estimated marginal means
*. The mean difference is significant at the .05 level.
b. Adjustment for multiple comparisons: Bonferroni.

On the other hand, in Table 5.51, there was no significant interaction by the different proficiency levels of the listening + orthography group between their performance at pre-test and post-test on the picture-naming task (p = 0.595) and (F = 0.533). Partial eta effect size stood at (ηp^2 = 0.051), indicating 5.1% (a small effect size) of the improvement by proficiency level. These results suggest that although the combined group attained a significant improvement between pre-test and post-test on the picture-naming task as seen in the main effect of the repeated measures ANOVA analysis ($p \leq 0.05$), there was no significant relationship ($p > .05$) in the performance of the proficiency levels of the group. Figure 5.15 shows the mean scores of the listening + orthography group partitioned across pre-test and post-test showing the variations for the different proficiency levels between time '1' and time '2' (see appendix L.8 for the differences in mean scores). There was a significantly better improvement between pre-test and post-test mean scores of the elementary-level learners than the breakthrough-level and beginner-level learners, which support the prediction in **H1.5**.

5.4.3.3 Listening-only group picture-naming task

Box plot visual assessment was conducted for the data of the listening-only group on the picture-naming task. There were no outliers revealed in either pre-test or post-test (see box plots in appendix J.9).

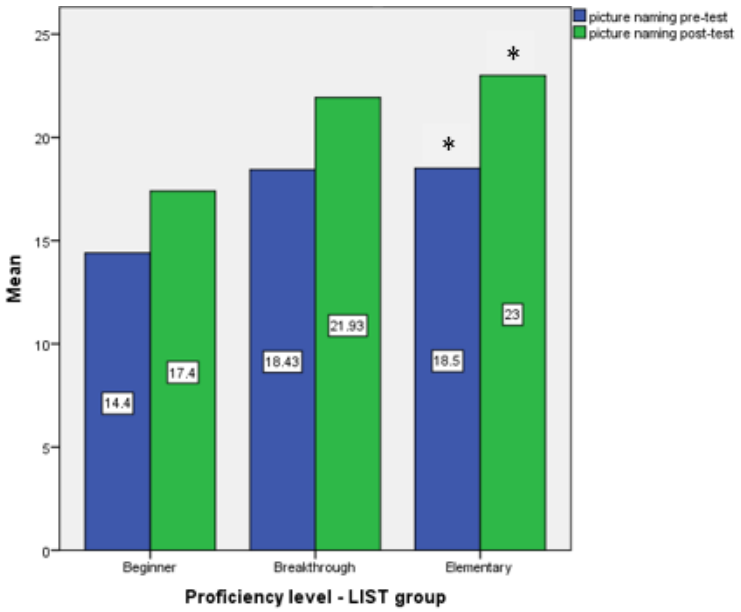


Figure 5.16 LIST group picture-naming task by proficiency levels

The repeated measures ANOVA results in Table 5.53 revealed a statistically significant improvement ($p \leq 0.05$) by the listening-only group combined $p = 0.001$. Post-hoc comparison using Bonferroni adjustment as shown in Table 5.54 indicated that the scores between the three proficiency levels of the listening only group was not statistically significant ($p > 0.5$). There was not a significant interaction ($p > 0.05$) in the repeated measures ANOVA results of the listening-only group in Table 5.53 ($p = 0.845$) and ($F = 0.170$). Partial eta square stood at ($\eta p^2 = 0.017$), a small effect size of 1.7% indicating no significant variation between the scores obtained by the different proficiency levels between pre-test and post-test. This means that there was no difference between pre-test and post-test performance obtained across the different proficiency levels after four weeks of instruction (see appendix L.9 for the difference in scores obtained by the listening-only group).

Table 5.53 Repeated measures ANOVA table of LIST group by proficiency level on the picture-naming task: Tests of Within-Subjects Effect

Source		F	Sig.	Partial Eta Squared
pre & post picture naming	Sphericity Assumed	15.342	.001	.434
	Greenhouse-Geisser	15.342	.001	.434
	Huynh-Feldt	15.342	.001	.434
	Lower-bound	15.342	.001	.434
pre & post picture naming * proflev	Sphericity Assumed	.170	.845	.017
	Greenhouse-Geisser	.170	.845	.017
	Huynh-Feldt	.170	.845	.017
	Lower-bound	.170	.845	.017

Table 5.54 Post-hoc table of LIST group picture-naming task by proficiency level

(I) Proficiency level - LIST group	(J) Proficiency level - LIST group	Mean Difference (I-J)	Std. Error	Sig.[a]
Beginner	Breakthrough	-4.279	2.339	.247
	Elementary	-4.850	3.012	.369
Breakthrough	Beginner	4.279	2.339	.247
	Elementary	-.571	2.546	1.000
Elementary	Beginner	4.850	3.012	.369
	Breakthrough	.571	2.546	1.000

Based on estimated marginal means
a. Adjustment for multiple comparisons: Bonferroni.

Figure 5.16 shows the variation between the mean scores of the listening-only group at pre-test and post-test showing the elementary-level learners as the proficiency level with a better variation of 4.5 points compared to the beginner-level with 3 points and the breakthrough-level learners with 3.5 points (see appendix L.9 for the table of the mean scores and differences). Although the variation across proficiency level was not great, the results of the elementary level learners support **H1.5** because they improved more, as was predicted.

In sum, the hypothesis for the independent variable was supported by the results of all the three experimental condition groups on the picture-naming task. Figure 5.17 shows a summary of the groups with asterisk on the group that improved significantly more.

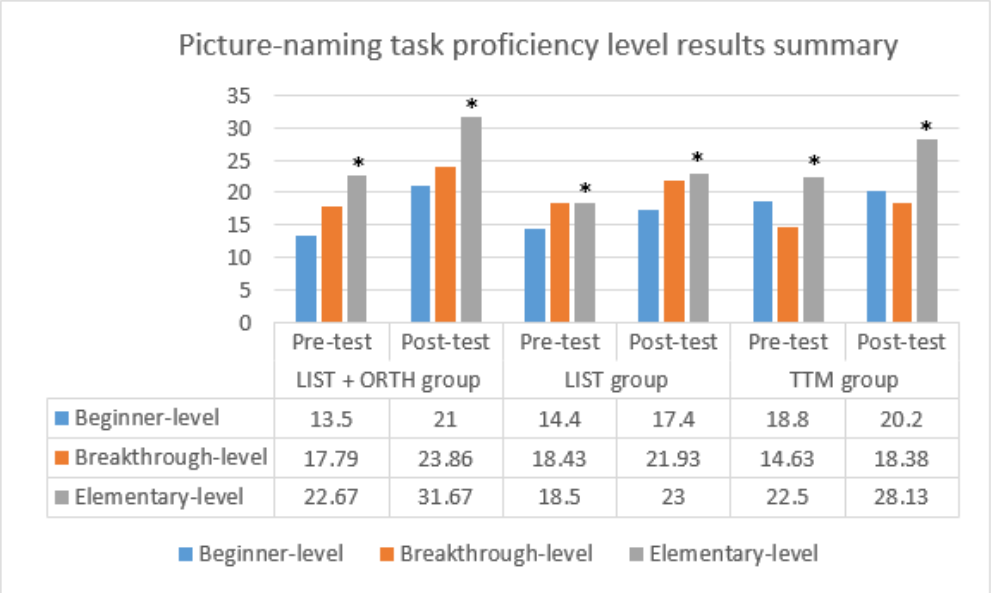


Figure 5.17 Summary of the mean scores by proficiency levels of the groups on the picture-naming task

5.4.4 Results by proficiency level on the reading aloud task

In the previous section, the results in picture-naming revealed significant improvement ($p \leq 0.05$) between pre-test and post-test by all the three proficiency levels combined of the three experimental condition groups. Looking at the individual performances of the different proficiency levels, significant improvements were revealed in the mean scores of the elementary-level learners (higher proficiency level based on OQPT scores) of all the three experimental condition groups as was predicted in **H1.5**. In this section, the results of the second production test in reading aloud task are presented.

5.4.4.1 Traditional teaching method group reading aloud task

Box plot visual inspection of the traditional teaching method group was conducted and entry 9 from the elementary-level was detected as an outlier in the box plots of both pre-test and post-test with particularly low scores (see box plots in appendix J.10). Hence, both the pre-test and post-test data of entry 9 were excluded from the repeated measures ANOVA analysis.

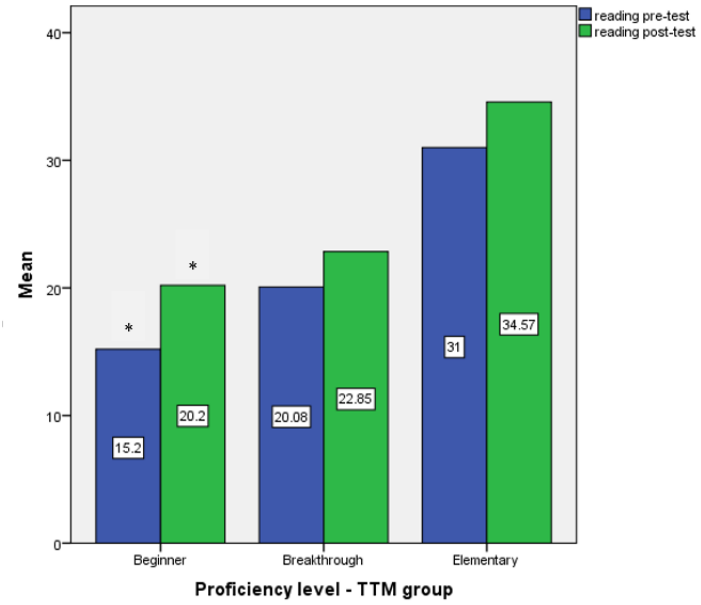


Figure 5.18 TTM group reading aloud task by proficiency level

A statistically significant improvement was revealed in the repeated measures ANOVA results of all the combined proficiency levels of the traditional teaching method group in Table 5.55 ($p = 0.001$) Post-hoc comparison using Bonferroni adjustment shown in Table 5.56 indicated that for the scores between the beginner-level learners and the elementary-level learners was significant ($p = 0.037$), likewise the scores between the breakthrough-level learners vs the elementary-level learners ($p = 0.054$). There was however no significant difference between the

scores of the beginner-level learners and the breakthrough-level learners ($p > 0.05$). There was non-significant interaction effect in the repeated measures ANOVA results in Table 5.55 ($p = 0.675$) and ($F = 0.401$) with partial eta squared = (ηp^2 0.035), a small effect size, indicating 3.5% of the variation in the scores.

The mean scores of the traditional teaching method group presented in Figure 5.18 revealed the variations between the scores partitioned across the group between pre-test and post-test. The greater increment between pre-test and post-test was by the beginner-level learners (difference of 5 points) compared to the breakthrough-level and elementary-level learners (see Appendix L.10 for the table of the mean scores and differences). Contrary to the prediction in **H1.5**, although there was variation in the mean scores of the different proficiency levels between time '1' and time '2', the higher proficiency level learners (based on OQPT scores), i.e. the elementary-level, did not differ as much as the lower proficiency level learners, i.e. the beginner-level. This could mean that the combined improvement of the traditional teaching method group on the reading aloud task as seen in the main effect of the repeated measures ANOVA analysis might not be due to their proficiency levels. This could have happened by chance considering that the variation between pre-test and post-test mean scores of all three experimental condition groups was not far apart on the ABX epenthesis task (see appendix K.1)

Table 5.55 Repeated measures ANOVA table of TTM group by proficiency level on the reading aloud task: Tests of Within-Subjects Effect

Source		F	Sig.	Partial Eta Squared
pre & post reading	Sphericity Assumed	13.534	.001	.381
	Greenhouse-Geisser	13.534	.001	.381
	Huynh-Feldt	13.534	.001	.381
	Lower-bound	13.534	.001	.381
pre & post reading * proflev	Sphericity Assumed	.401	.675	.035
	Greenhouse-Geisser	.401	.675	.035
	Huynh-Feldt	.401	.675	.035
	Lower-bound	.401	.675	.035

Table 5.56 Post-hoc table of TTM group reading aloud task by proficiency level

(I) Proficiency level - TTM group	(J) Proficiency level - TTM group	Mean Difference (I-J)	Std. Error	Sig.[b]
Beginner	Breakthrough	-3.762	4.978	1.000
	Elementary	-15.086*	5.539	.037*
Breakthrough	Beginner	3.762	4.978	1.000
	Elementary	-11.324	4.435	.054*
Elementary	Beginner	15.086*	5.539	.037*
	Breakthrough	11.324	4.435	.054*

Based on estimated marginal means
*. The mean difference is significant at the .05 level.
b. Adjustment for multiple comparisons: Bonferroni.

5.4.4.2 Listening + orthography group reading aloud task

Box plot visual inspection of the listening + orthography group on the reading aloud task did not reveal any outliers in either pre-test or post-test, hence, no data was excluded from the analyses (see appendix J.11 for the box plots).

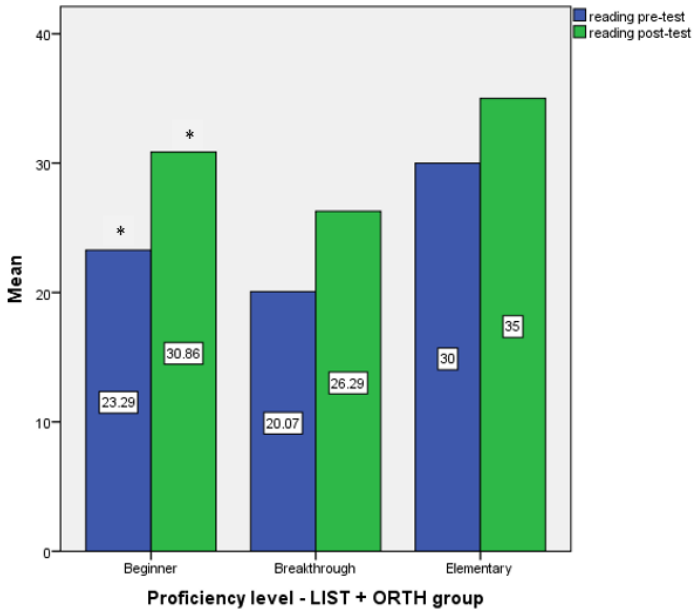


Figure 5.19 LIST + ORTH group reading aloud task by proficiency levels

A repeated measures ANOVA analysis was conducted with tests on the reading aloud task as the dependent variable and proficiency level as the independent variable. The repeated measures ANOVA analysis generated the results in Table 5.57 which revealed a statistically significant improvement by proficiency level combined in the listening + orthography group (p = 0.001). However, post-hoc comparison using Bonferroni adjustment as shown in Table 5.58 revealed a non-statistically significant difference between the scores of all the three proficiency levels (p > 0.05). There was a non-significant interaction by the different proficiency levels within the listening + orthography group on the reading aloud task (p = 0.584) and (F = 0.552)

in Table 5.57. Partial eta squared effect size was (ηp^2 = 0.050), a small size indicting that 5% of the improvement by proficiency level can be accounted for by the time of measurement between time '1' and time '2'.

Table 5.57 Repeated measures ANOVA table of LIST + ORTH group by proficiency level on the reading aloud task: Tests of Within-Subjects Effect

Source		F	Sig.	Partial Eta Squared
pre & post reading	Sphericity Assumed	44.801	.000	.681
	Greenhouse-Geisser	44.801	.000	.681
	Huynh-Feldt	44.801	.000	.681
	Lower-bound	44.801	.000	.681
pre & post reading * proflev	Sphericity Assumed	.552	.584	.050
	Greenhouse-Geisser	.552	.584	.050
	Huynh-Feldt	.552	.584	.050
	Lower-bound	.552	.584	.050

Table 5.58 Post-hoc table of LIST + ORTH group reading aloud task by proficiency level

(I) Proficiency level - LIST + ORTH group	(J) Proficiency level - LIST + ORTH group	Mean Difference (I-J)	Std. Error	Sig.[a]
Beginner	Breakthrough	3.893	4.012	1.000
	Elementary	-5.429	5.981	1.000
Breakthrough	Beginner	-3.893	4.012	1.000
	Elementary	-9.321	5.514	.317
Elementary	Beginner	5.429	5.981	1.000
	Breakthrough	9.321	5.514	.317

Based on estimated marginal means
a. Adjustment for multiple comparisons: Bonferroni.

Figure 5.19 shows the variations in the mean scores obtained by the different proficiency levels of the listening + orthography group at pre-test and post-test reading aloud task . A significant improvement was revealed in the scores of the beginner-level learners which is similar to that of the traditional teaching method group (see mean scores and differences in appendix L.11). These results do not support the prediction in **H1.5** that higher proficiency learners will improve more. Here we see the beginner-level learners (lower proficiency level) performed better than those at higher proficiency levels.

5.4.4.3 Listening-only group reading aloud task

The same procedure for testing the assumption of normality was conducted for the data of the listening-only group and no outlier was detected as shown in the box plots of both pre-test and post-test (see appendix J.12 for the box plots). This suggest the assumption that the data was approximately normally distributed among the listening-only group and therefore no data was excluded from the analysis.

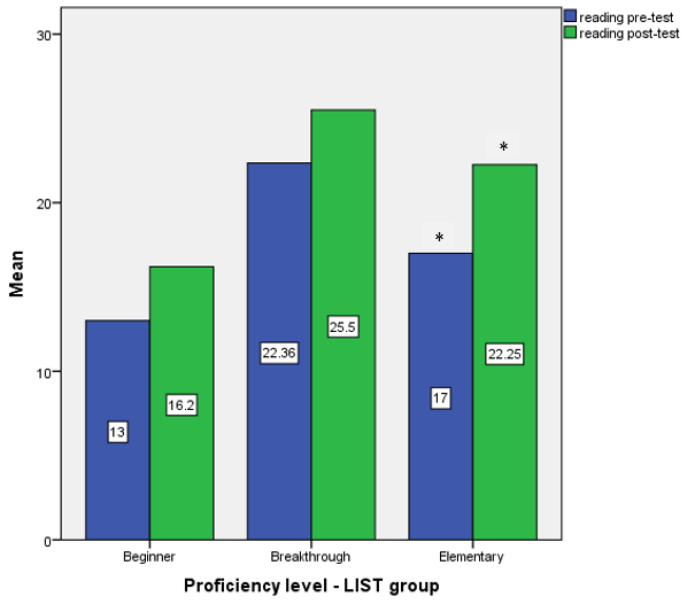


Figure 5.20 LIST group reading aloud task by proficiency level

As there were no outliers detected in the box plots of the listening-only group in either pre-test or post-test. A repeated measures ANOVA analysis conducted for the data of all the 23 participants in the listening-only group. A statistically significant improvement ($p \leq 0.05$) was revealed in the results of the repeated measures ANOVA analysis of all the proficiency levels combined in the listening-only group as shown in Table 4.49 ($p = 0.001$). However, post-hoc comparison using Bonferroni adjustment as shown in Table 5.60 revealed a non-significant difference between the scores of all the three proficiency levels of the listening only group ($p > 0.5$). There was a non-significant interaction by the different proficiency levels ($p = 0.493$) and ($F = 0.734$) with partial eta squared ($\eta p^2 = 0.068$) indicating 6.8% (a medium effect size) of the variation of the scores at pre-test and post-test.

Figure 5.20 shows the bar charts of the mean scores of the listening-only group with the variations obtained by the different proficiency levels in the group (see also the difference in mean scores in appendix L.12). The elementary-level learners improved more on the reading aloud task than the breakthrough-level and the beginner-level learners which support the prediction in **H1.5**.

Table 5.59 Repeated measures ANOVA table of LIST group by proficiency level on the reading aloud task: Tests of Within-Subjects Effect

Source		F	Sig.	Partial Eta Squared
pre & post reading	Sphericity Assumed	26.132	.000*	.566
	Greenhouse-Geisser	26.132	.000	.566
	Huynh-Feldt	26.132	.000	.566
	Lower-bound	26.132	.000	.566
pre & post reading * proflev	Sphericity Assumed	.734	.493	.068
	Greenhouse-Geisser	.734	.493	.068
	Huynh-Feldt	.734	.493	.068
	Lower-bound	.734	.493	.068

Table 5.60 Post-hoc table of LIST group reading aloud task by proficiency level

(I) Proficiency level - LIST group	(J) Proficiency level - LIST group	Mean Difference (I-J)	Std. Error	Sig.[a]
Beginner	Breakthrough	-9.329	5.676	.348
	Elementary	-5.025	7.308	1.000
Breakthrough	Beginner	9.329	5.676	.348
	Elementary	4.304	6.177	1.000
Elementary	Beginner	5.025	7.308	1.000
	Breakthrough	-4.304	6.177	1.000

Based on estimated marginal means
a. Adjustment for multiple comparisons: Bonferroni.

In sum, contrary to the prediction in **H1.5**, the beginner-level learners (lower proficiency based on OQPT) of the traditional teaching method group and the listening + orthography group showed better improvement on the reading aloud task than the elementary-level learners (higher proficiency level). Only the results of the listening-only group support the hypothesis with the better improvement seen by the performance of the elementary-level learners. Overall, as reported in section 5.3.4 on the effects of instruction, the listening + orthography group revealed significant improvement on the reading aloud task than the traditional teaching method group and the listening-only group. This is shown in the summary of the proficiency levels mean scores of the three experimental condition groups in Figure 5.21.

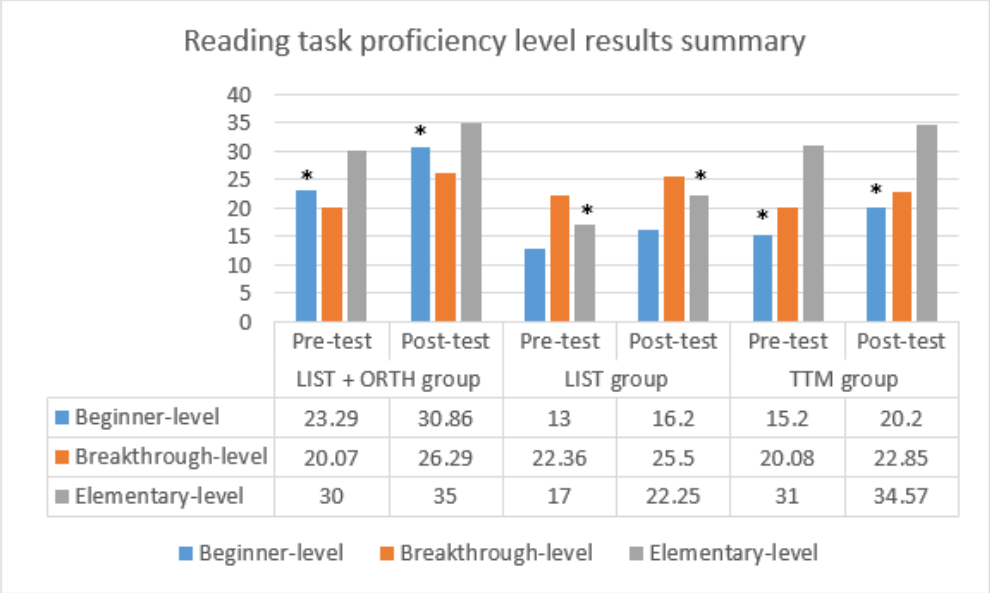


Figure 5.21 Summary of the mean scores by proficiency levels of the groups on the reading aloud task

In the following section, a comparison is made of the production and percpetion tests for the experimental condition groups in order to see if there is correlation between production and percption.

5.5 Production vs perception tests correlations

This section looks at the correlation coefficient (Pearson *r*) analysis of pre-test and post-test production vs perception results of the experimental condition groups to see if there was significant correlation. The correlation analysis was conducted to provide evidence to support **H3** which predicts that:

H3. There will be a correlation between the production and perception task performance of the groups.

Correlation value ranges from -1 to 1 and correlation is given by using the small letter *r*. There is a possible strong positive correlation if *r* is 1 and a possible negative correlation if *r* is -1. A correlation of 0 means there is no correlation (Lowei and Seton 2013). In addition, a 2-way univariate ANOVA analysis was also conducted to capture the interaction between the dependent variables (i.e. production and perception pre-test and post-test) and the independent variables (experimental condition groups and proficiency level). However, there were no significant interactions revealed ($p > 0.05$) in any of the univariate analyses as such it was not reported in this study.

As seen in this study, two production test (i.e. picture-naming and reading aloud tasks) and two perception test (i.e. epenthesis and dictation tasks) were conducted. The justification for doing so as mentioned in Chapter Four section 4.3.4 is in order to see whether the effect of orthographic input is equal on learners' production and perception. Therefore, one test involving the use of orthography in both production and percption tests was employed. In addition, bar charts of the learners' performance at pretest and post-test on both production and percption tests is presented by the effect of instruction and proficiency level.

A correlation coefficient analysis was conducted to measure the relationship between pre-test and post-test perception and production of the 73 participants in the study. This is done in order to check if there was influence between perception pre-test (M = 33.58, SD = 11.303), perception post-test (M = 43.58, SD = 13.756) and production pre-test (M = 38.99, SD = 12.922), production post-test (M = 48.11, SD = 15.464) as shown in Table 5.61.

Table 5.61 Descriptive statistics for production and perception

	Mean	Std. Deviation	N
Perception pre-test	33.58	11.303	73
Perception post-test	43.44	13.756	73
Production pre-test	38.99	12.922	73
Production post-test	48.11	15.464	73

The Pearson's r results shown in Table 5.62 revealed a statistically significant strong positive correlation between perception pre-test and post-test, r = 0.878, p = 0.001 and also between production pre-test and post-test, r = 0.903, p = 0.001. Upon examination of the results for the relationship across the various tests, there was a moderate positive significant correlation between perception pre-test and production pre-test, r = 0.695, p = 0.001. A moderate positive correlation is seen between perception pre-test and production post-test r = 0.637, p = 0.001. Similarly, a significant positive correlation was also revealed on perception post-test and production pre-test, r = 0.774, p = 0.001, and also between perception post-test and production post-test, r = 0.758, p = 0.001 (see appendix M for the scattered plots).

Table 5.62 Pearson correlation table of experimental condition groups on the production and perception tests

		Perception pre-test	Perception post-test	Production pre-test	Production post-test
Perception pre-test	Pearson Correlation	1	.878**	.695**	.637**
	Sig. (2-tailed)		.000	.000	.000
	N	73	73	73	73
Perception post-test	Pearson Correlation	.878**	1	.774**	.758**
	Sig. (2-tailed)	.000		.000	.000
	N	73	73	73	73
Production pre-test	Pearson Correlation	.695**	.774**	1	.903**
	Sig. (2-tailed)	.000	.000		.000
	N	73	73	73	73
Production post-test	Pearson Correlation	.637**	.758**	.903**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	73	73	73	73

**. Correlation is significant at the 0.01 level (2-tailed).

The results in Table 5.62 shows that there was relationship between production pre-test and post-test and perception pre-test and post-test. This relationship is obviously stronger than the correlations across the various tests as explained above. A smaller correlation is seen between perception and production pre-test and post-test. These results support the prediction in **H3** and show that there is a positive relationship between perception performance of the groups at pre-test and post-test across their performance at production pre-test and post-test. This shows that the learners improved more or less equally between pre-test and post-test production and perception. Additionally, Figure 5.22 and Figure 5.23 show the summary of the overall percentage scores obtained by the learners for perception and production by the effect of instruction and proficiency levels respectively.

In Figure 5.22, the listening + orthography group obtained a greater significant improvement on perception test with difference of 14.7% between pre-test and post-test compared to the traditional teaching method group and the listening-only group with difference of 13% and 9% respectively. Similarly, the listening + orthography group improved even more on the production test with a difference of 16.5% compared to 8.7% difference by the traditional teaching method group, and 9.2% by the listening-only group. In sum, the listening + orthography group improved more on both production and perception tests combined than the traditional teaching method group and the listening-only group.

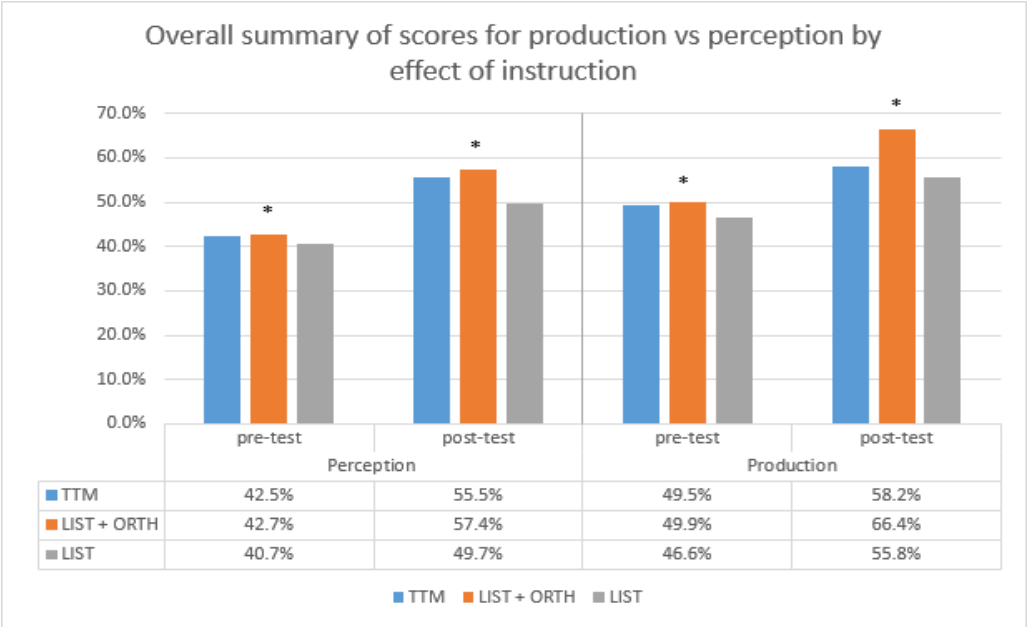


Figure 5.22 Production vs perception summary of scores by the effect of instruction

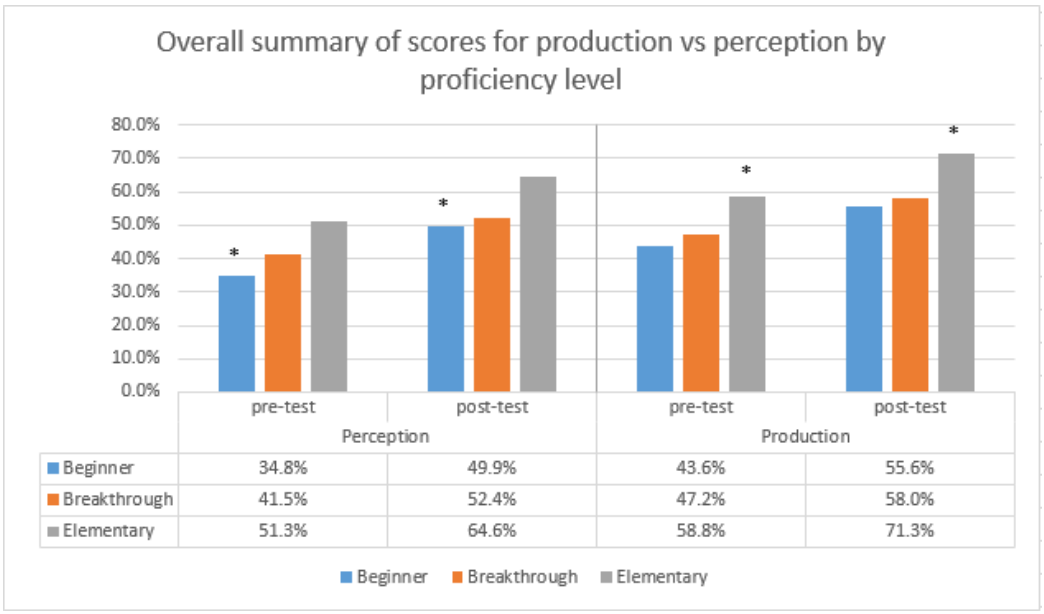


Figure 5.23 Production vs perception summary of scores by proficiency level

In Figure 5.23, the beginner-level learners obtained better significant improvement between pre-test and post-test on the perception test with difference of 15.1%, compared to the breakthrough-level learners with difference of 10.9% and the elementary-level with 13.3%. On the other hand, the elementary-level learners improved better on the production test with a difference of 12.5% compared to the breakthrough-level learners with 10.8% and the beginner-level learners with 12%. These percentage scores of the proficiency level show that the beginner-level learners (lower proficiency level based on OQPT scores) improved well on the perception test and equally on the production test, Although the elementary-level learners

improved more on the production test but the difference between their percentage scores with the beginner-level is less than 1%.

The next section summarises the entire results in support of the hypotheses of the study.

5.6 Support for hypotheses

The hypotheses presented in Chapter Four section 4.2 consist of one general hypothesis followed by three specific hypotheses with sub-hypotheses. In this section these hypotheses are listed and a summary of whether and how each hypothesis was supported by the results is provided.

General Hypothesis

The general prediction that formed the baseline for this study is that although Tera, Hausa and English all use the Roman alphabet they have their own orthographies, grapheme-phoneme correspondences differ and this will affect Tera/Hausa speakers' L2 phonology.

Based on the assumption in the general hypothesis, specific predictions were made to address the variables of this study about Tera/Hausa learners of L2 English who were involved in an experimental intervention study. In this section, each specific/sub-specific hypothesis is taken and discussed.

H1. The effect of instruction on experimental condition groups will improve performance between time '1' and time '2' in production and perception and as a result:

> ***H1.1 - Experimental learners will be more sensitive in discriminating epenthesized stimulus when presented alongside the correct stimulus in the ABX epenthesis task.***

The ABX epenthesis task results were presented in detail in section 5.3.1. It was predicted that the listening + orthography group will be more sensitive in discriminating epenthesized stimuli more compared to the listening only and the traditional teaching method groups. However, the results showed that the traditional teaching method group improved more on the epenthesis task. The mean scores of the traditional teaching method group and the listening + orthography group did not differ significantly. In fact, judging by the general performance of the entire study sample as shown in Figure 5.1, it could be assumed that correct guessing of the correct token that matches with X between A and B was successful on the ABX epenthesis task for all participants despite their proficiency level or experimental condition group. **H1.1** is rejected.

H1.2 - Experimental learners will improve perception of grapheme-phoneme correspondences of words involving L2 English consonant clusters, digraphs in clusters, digraph singletons and silent singletons and consequently write them correctly in the dictation task due to the effect of orthography.

The aim of the dictation task was to check the effect of orthography in the experimental learners' perception of grapheme-phoneme correspondences and whether they will be able to write the correct forms in the dictation task. The results support **H1.2** in that the listening + orthography group showed more improvement between time '1' and time '2'. The effect of NS aural input along with orthographic input had a significant effect on the experimental learners' perception of the consonant clusters, silent singletons, digraph singletons and digraph clusters and led to their improved writing of the test stimuli. This was shown in the significant improvement on all nine test token types in the t-test results of the listening + orthography group in Table 5.19. The traditional teaching method with non-native speaker aural input also showed significant improvement. The listening only group was lowest in improvement thus suggesting that NS aural input alone is not enough to cause improvement.

H1.3 - Experimental learners will exhibit better production of grapheme-phoneme correspondences than the comparison groups due to the availability of orthography in the monitored oral reading production task.

Like in the dictation task, the reading aloud task was also aimed at checking the effect of orthographic influence in learners' production of the test stimuli. The prediction in **H1.3** was supported by the significant improvement of the listening + orthography group compared to the traditional teaching method and the listening only groups. There was more improvement between time '1' and time '2' in the mean scores of the listening + orthography group on the reading aloud task due to the effect of orthography during learning. Although the traditional teaching method group also had orthographic input, they did not improve as much as the listening + orthography group. This could have been due to the differences in the aural input, i.e. recorded NS aural input vs NNS aural input. The percentage of correct scores and differences by the groups shows the listening + orthography group with better improved percentage scores between time '1' and time '2' on all the nine test token types. This supports the prediction in **H1.3** and shows that orthographic influence alongside the right aural input played a role on the experimental learners' improved production on the reading aloud task as presented in section 5.3.4.

H1.4 - Experimental learners will improve in producing the test stimuli when presented with their pictures in the picture-naming task.

While both reading aloud and picture-naming tasks involved elicitation of learners' production, there was no access to orthography. The prediction in **H1.4** was supported by the results of the reading aloud task. The listening + orthography group yielded significant improvement on all nine test token types in Table 5.25. When the performance of the listening + orthography group was compared with those of the listening only group and traditional teaching method group, a significant difference in the mean scores and the percentage of correct scores between time '1' and time '2' was revealed in the results of the listening + orthography group and thus supports this hypothesis.

H1.5 - Learners with higher proficiency will improve more on all experimental condition groups.

With respect to the proficiency level, there were mixed results. The proficiency level of the learners was determined based by their scores on the OQPT. As a reminder, the groups consisted of beginner-level learners (i.e. those that scored 0-9 out of 40), breakthrough-level learners (scored 10-15 out of 40), and elementary-level learners (scored 16-23 out of 40). It was predicted in **H1.5** that learners with higher proficiency level will improve more on all the tasks. However, the results only partially supported this prediction. There was no consistency in the results of the highest proficiency level, (i.e. the elementary-level learners). The performance of the elementary-level learners' in the three experimental condition groups supports the hypothesis on the picture-naming task and on the dictation task just for the listening + orthography group and the traditional teaching method group. Contrary to the hypothesis, the beginner-level learners (lowest level) of all the three experimental condition groups improved more between pre-test and post-test on the epenthesis task. On the reading aloud task, just the listening + orthography group and the traditional teaching method beginner-level learners improved more than the other proficiency levels.

H2. The effect of instruction will lead to a decrease in learners' production and perception error rates between time '1' and time '2'. As a result:

H2.1 - Experimental learners will reduce their error rate on the categories of errors

On the one hand, this study consisted of two production tests, i.e. picture-naming and reading aloud. The results on the categories of error types on production show lower error rate by the listening + orthography group in picture-naming and reading aloud compared to the traditional teaching method group and listening-only group as shown in section 5.2.1. This supports the

prediction in **H2.1**. There was a significant reduction in error rate by the listening + orthography group on all six categories, (i.e. vowel epenthesis, consonant cluster reduction, phone substitution, metathesis, orthography-based production, and loanword transfer production) on both production tasks. This study consisted of two perception tasks, i.e. epenthesis and dictation. The ABX epenthesis task errors were in the wrong choice of the correct option between A and B that matches with X. Therefore, only the dictation task errors were explained for the error categories (i.e. vowel epenthesis, deletion, substitution, metathesis, orthographic influence and loanword spelling). For the dictation task, the listening + orthography group had a significant reduction of error rates on all the error categories just like in the production test. This also supports **H2.1**. Therefore, it can be concluded that the instruction method was effective and played a role in the variation in reduced error rates by the participants.

H2.2 - There will be difference in error rates of learners whose proficiency level is higher.

With respect to the error rate reduction by learners based on their proficiency level, there were mixed results just like in **H1.5** above. Only the dictation task results fully support the prediction in **H2.2** which shows the elementary-level learners with significant reduced error rates than the beginner-level and breakthrough-level learners as shown in section 5.2.2, Table 5.7. The percentage on the picture-naming task only partially supported **H2.2** because there was a distributed percentage improvement by the proficiency levels as shown in section 5.2.1.1, Table 5.2. On the contrary, the hypothesis was completely unsupported by the percentages on the reading aloud task which showed significant improvement on five out of the six error categories by the beginner-level learners, and only on one category (i.e. loanword transfer production) by the breakthrough-level learners as shown in Table 5.5. The least improvement was by the elementary-level leaners.

H3. There will be correlation between the production and perception task performance of the groups.

The correlation coefficient results conducted to measure the relationship between pre-test and post-test perception and production performances of the groups revealed significant positive correlations. There was also a positive correlation across production and perception pre-test and post-test. This shows that the improvement by the learners was more or less equal between pre-test and post-test production and perception. This supports the prediction in **H3**.

In sum, recall in Chapter Two section 2.6 on the comparison of Tera, Hausa and English, it was mentioned that because Tera and Hausa do not have complex syllables like English, speakers

use vowel epenthesis as a repair strategy for clusters in English loanwords. For instance, *plank* → /fi.laŋ.ki/, *table* → /tebur/, *screw* → /su.ku.ru/. The results of the two production tasks (picture-naming and reading aloud) and dictation task all reveal these difficulties with learners' errors in production and spelling. Examples include the epenthesis of [u] and [o] in onset clusters e.g. *clock* → [kulok, kolok] and *drum* → [durom]; epenthesis of [ɪ] in digraph clusters e.g. *bench* → [benʧɪ] and *syringe* → [sɪrɪnʤɪ]. Additionally, Tera and Hausa both have transparent grapheme-phoneme correspondences unlike English which has a spelling-sound correspondences which can sometimes be arbitrary, unpredictable and irregular. This was stated to be a problem for L2 learners of English whereby the non-transparent English spelling affects their pronunciation and spelling. This can be seen in English silent singletons where a sound has a graphemic value but no phonological value e.g. <k> in *knife* /naɪf/ was produced in the production tasks as [**k**inaɪf], and with vowel epenthesis. In the perception dictation test however, the silent letter was omitted, it was spelled <nife> or <naif>.

In the following chapter, discussion of the results is presented comprehensively in light of the previous studies reviewed.

Chapter 6: Discussion

6.1 Introduction

In Chapter Five, the results of the present study were presented. Qualitative results of the groups were presented in section 5.2 in the tables of percentage errors. For the quantitative analysis, see appendix K for the tables of the summary of mean scores for effects of instruction, and appendix L for the summary tables of mean scores by proficiency levels. An asterisk is used on the scores of the groups that had significant improvement. Generally, the results revealed that instruction method showed the effect of orthographic input. Moreover instruction method predicted better reduced error rates in the learners' performance than proficiency level. The listening + orthography group had better reduced error rates than either the listening-only group or the traditional teaching method group in both production and perception error categories thus supporting **H2.1**. However, the qualitative analysis results by proficiency level only partially supported **H2.2** because there was a scattered improvement in the reduced error rates by the different proficiency levels on both production and perception error categories. This shows that proficiency level did not really play as great a role in the learners' error rate reduction as much as the effect of instruction. Secondly, the quantitative analysis provided statistical results on the significant improvement of the learners after four weeks of instruction by the effect of instruction and proficiency level. Here also, the results by the effect of instruction seem to suggest that the instruction method led to better improvements by the listening + orthography group on all the four tasks. Although the traditional teaching method group improved more on the epenthesis task, however, they did not differ significantly from the listening + orthography group (mean difference of 0.22 points).

In this present chapter, discussion of the research questions and hypotheses in light of the results from the various experiments conducted in this study is provided. The structure of the chapter is as follows: a brief overview of the aims of the research and the procedure for the study are presented as a reminder in section 6.2. Then in the subsequent sections, links are made with the results obtained from the experiments with regards to the hypotheses of the study and the literature. Firstly, the discussions on the effect of instruction in L2 pronunciation are presented in section 6.3. This is followed by the discussion on L2 orthographic and phonological influence in section 6.4. We then progress to look at the effect of proficiency level in the learners' performance in section 6.5, followed by the discussion on the relationship between production and perception in section 6.6. The chapter concludes with discussion on possible pedagogical

implications with respect to the experimental investigations conducted in this research for pronunciation instruction in the secondary school in Nigeria in section 6.7.

6.2 Aims of the research revisited

Earlier in the study (in Chapters One and Three) we discussed the place of pronunciation in the English language syllabus in Nigeria's secondary schools, stating that it is a problematic area for most students due to factors which include for example the complexity of the relationship between orthography and correspondence with oral English, the influence of the students' L1, and the method of teaching that the students have been exposed to. In addition, discussion on the effects of orthographic input and phonological transfer in L2 acquisition of phonology was provided in Chapter Three with reviews of studies in these areas. Orthographic input studies reviewed in the chapter centred around the effects of orthographic forms on L2 learners' pronunciation of known words as well as new words, the effects of grapheme-phoneme correspondences, and the effects of orthographic forms leading to learners' epenthesis, deletion and metathesis to resolve L2 complex consonant clusters, for example, Bassetti (2008); Young-Scholten (2002); Rafat (2011 & 2016); Hayes-Harb, Nicol and Barker (2010); Bassetti, Escudero and Hayes-Harb (2015); Bassetti and Atkinson (2015); Young-Scholten, Akita and Cross (1999). In addition, on phonological transfer, studies reviewed centered around factors that lead to phonological transfer and cause of intelligibility by L2 learners, for example, Lado (1957), Weinreich (1953), Major (2008), Flege (1992), Kenworthy (1987).

In view of the above, this research was based on the idea that the difficulties that L2 English pronunciation creates for L1 Tera/Hausa learners in Nigeria can be addressed by better teaching. Specific aims of the study include:

1. To experimentally investigate the effect of instruction on phonology of L2 English production and perception by L1 Tera/Hausa learners with regard to consonant clusters, silent singletons, digraph singletons and digraphs in clusters.
2. To bring Tera in to the limelight and to prompt other researchers to investigate other areas of this minority and understudied language.

All these put together formed the motivation for conducting this research. In order to achieve these aims, an experimental intervention study was conducted among 73 Tera/Hausa secondary school students.

6.3 The effect of instruction in L2 pronunciation

Problems with the teaching of pronunciation in Nigeria have been discussed in Chapter Three section 3.7 and it was noted there that pronunciation was either not explicitly taught or if taught at all, it was inadequate or ineffective in most public secondary schools in Nigeria. Many teachers of pronunciation do not form the right models for teaching pronunciation because they lack the proper training/qualification to do so, (Ufomata 2007, Musa 2012). These factors motivated this study which experimentally used recordings from native speaker as a model for the teaching and testing of pronunciation among Tera/Hausa secondary school students in Nigeria.

The effect of instruction is a fundamental issue that was highlighted in the results of this study as seen in Chapter Five. The results of the production and perception experiments demonstrate the effect of instruction among the study population. As was hypothesised, the effect of instruction yields significant improvement among learners in the listening + orthography group that received explicit orthographic and phonological instruction. As a result they performed better than the listening-only group who were taught using only phonological input with no orthography whatsoever; they also performed better than the traditional teaching method group who were taught using the normal teaching style. Additionally, it was also predicted that as a result of the instruction, the listening + orthography group would better reduce their error rates in vowel epenthesis, deletion, cluster reduction, substitution, orthographic influence in spelling/production, metathesis and loanword spelling/production. As seen in this study, the listening + orthography experimental condition group improved significantly more on the dictation, picture-naming and reading aloud. Although on the epenthesis task, the traditional teaching method group improved better but the variation between their mean scores with the listening + orthography group was not significant. In fact, the general performance of the entire study sample in the three experimental condition groups on the epenthesis task was not far apart and it was also the highest performance among the four tasks in the study (see Figure 5.5 for the overall summary of scores on the four tasks). And as stated in the summary of the results in Chapter Five section 5.5, the epenthesis task being an ABX discrimination task, possible correct guessing of the correct token that matches with X between A and B was successful on the epenthesis task for all participants regardless of their proficiency level or experimental condition group.

The results in this study, which show that instruction affects learners' performance as illustrated in the preceding paragraph, are consistent with previous studies that showed the effect of

instruction in experimental studies as discussed in Chapter Three. For example, Couper (2006) used speaking and listening tests with specific focus on epenthesis and deletion among two groups consisting of a treatment group with 21 participants and a baseline (control) group with 50 participants. Their age range was 18 - 44 years and they were all high intermediate-level learners with IELTS (International English Language Testing System) of 4.5 - 5.0 scores. Couper found that instruction on intelligibility, epenthesis and deletion led to dramatic gains and a high rate of reduced error rate which was greatly assimilated into the learners' phonological competency. This was revealed in the results of the treatment group who received explicit instruction over two weeks. On the other hand, the control group who received no explicit instruction achieved no gain in the aspects of the pronunciation for the study. Couper's result suggests that appropriate instruction can change learners' interlanguage phonology. In another study, Derwing *et al* (1998) conducted an experiment which focused on productions on accentedness and comprehensibility in a sentence task and a narrative task among three experimental condition groups. The groups consisted of 48 ESL learners all at intermediate proficiency level, ages 18 - 44. Derwing *et al* found that after 12 weeks of instruction, there was improvement as a result of instruction in three aspects of oral production (comprehensibility, fluency and accent) especially for the two pronunciation specific groups i.e. the segmental group and the global group. As seen in the present study, the effect of instruction on the experimental condition groups yielded significant improvement in the results of the listening + orthography group compared to the listening-only group and the traditional teaching method group.

Furthermore, when examining the effect of instruction based on the idea of teaching the same lesson whereby the listening + orthography group and the traditional teaching method group both had orthographic and aural input. But the only difference was that while the listening + orthography group had native speaker aural input via recorded audio sound, the traditional teaching method group had non-native speaker aural input. The effect of the different phonological inputs was evident in their results in which the listening + orthography group outperformed the traditional teaching group. In the same way, when comparing the listening + orthography group and the listening-only group, the effect of instruction is clearly reflected in their performance because although both groups received recorded native speaker aural input, only the former group had orthographic input during instruction. This revealed the effect of instruction through the differences in their performance. This finding is consistent with previous studies discussed in Chapter Three. For instance, Champagne-Muzar *et al* (1993) used a discrimination and controlled production test among English, Chinese, Spanish, German and

Arabic beginning-level FSL (French as a second language) learners divided into a treatment group and a control group. There were 15 participants in the treatment group and 19 participants in the control group who received the same instruction by the same French teacher using two different methods in the language laboratory. Their age range was 18 - 25 years. The treatment group were taught using the French phonetic training programme whereas the control group were taught using the normal teaching style. They found that the learners who went through the French phonetic training programme improved their discrimination and production ability and outperformed those learners that did not go through the programme. This was revealed in their significant improvement over the control group in their discrimination and production ability of phones, intonation, rhythm and global scales. In another study, Sumdangdej (2007) showed the effect of using native speaker model in pronunciation instruction in Thai schools among 80 young Thai children ages 6 - 11. Sumdangdej used two production tasks (repeat-after-tape and picture-naming) to test three groups of learners on syllable structure and stress. They were taught using different instruction methods. Two experimental groups comprised children who had yet started learning English, i.e. the *metalinguistic group* with 23 participants and the *primary linguistic group* with 27 participants. They received instruction on pronunciation using recorded native speaker input. A third group the control group comprising children who had started English in the first term with 30 participants had their normal lesson. The metalinguistic group received pronunciation training with child native speaker recorded phonological input focused on raising the meta-phonological consciousness of the learners. The primary linguistic group on the other hand received pronunciation training also with native speaker recorded phonological input but without consciousness raising. The results of the study revealed that those groups who had instruction with native speaker input outperformed the control group who had their normal lesson.

In addition, as far as the presence of orthographic input during instruction is concerned in the present study, it was a main factor that favoured the listening + orthography group and the traditional teaching method group who both had orthographic input during instruction to improve better than the listening-only group. Although, as earlier stated, both the listening + orthography group and the listening-only group had native speaker recorded phonological input at instruction, but the listening-only group had no orthographic input. The effect of orthography made a substantial difference between the performances of these two groups who had native speaker recorded aural input as seen in their results in Chapter Five. This finding does not totally conform to the findings in previous studies discussed in Chapter Three. For example, in Sumdangdej's (ibid) study, there was significant improvement revealed in the results of the

metalinguistic group who had consciousness raising procedures, and the *primary linguistic group* who had no consciousness raising. Both groups had native speaker phonological input. The results in the study show that having native speaker input makes a difference in achieving native-like production even without consciousness-raising. However, this does not seem to be the case in the present study because the learners who received only native speaker recorded aural input with no orthographic input were disadvantaged and underperformed on dictation, picture-naming and reading tasks. The traditional teaching method group performed better than them because, although the latter had non-native speaker input, they had orthographic input as did the listening + orthography group. One probable factor that could have informed the performance of the traditional teaching method group could be that the two non-native speaker English Teachers (the research assistants) might have been effective in their pronunciation and could have affected the learners' performance.

Having discussed the effect of instruction as it affects the learners' production and perception of orthographic and phonological forms, we will now turn to discuss other effects with regards to L2 orthographic and phonological influence.

6.4 L2 orthographic and phonological influence

It was observed that the learners transferred their L1 Tera/Hausa syllable structures to the L2. This was problematic since the L1 syllable structures are less complex than those of the L2. They employed the use of different strategies to resolve the problems with the L2 syllable structures. This is seen for instance in their epenthesis of vowels to resolve complex structures in consonant clusters so that they could conform to their L1 structures, and also in the deletion of one or more segments. For example when the learners were presented with onset and coda clusters with CC or CCC structures, they epenthesised vowels to resolve the cluster in both oral and written productions. For instance, [o] epenthesis in *clock* /klɒk/ pronounced [k**o**lok] and spelled <colock>, [ɪ] epenthesis in *bench* /benʧ/ pronounced [benʧ**ɪ**] and spelled <benchi>. As for deletion, for instance [r] deletion in *straw* /stɹɔː/ pronounced [stɔː] and spelled <staw>. Likewise, [d] deletion in *hands* pronounced [hæns] (just like native speakers) and spelled <hans>. This conforms to Young-Scholten *et al's* (1999) study as discussed in Chapter Three in their study of English and Japanese speakers learning L2 Polish and how they resolved complex L2 Polish syllable structures. The learners were exposed to the written representations of Polish, a language with more complex syllable structure than both English and Japanese. Their results revealed that after having three sessions over several days of learning polish orthography and also having phonological input, the English and Japanese learners

demonstrated increased frequency of epenthesis and deletion in testing and learning. While the presence of orthography led to increased epenthesis for the learners, on the other hand, the absence of it led to increased deletion which is not exactly the case in the present study. The results differ from one experimental condition group to another, and from task to task. For the reading task where orthography was present, there was less deletion and more epenthesis by the traditional teaching method and the listening + orthography groups, whereas the listening only group had more epenthesis and less deletion (see Table 5.4). As for the absence of orthography on the picture naming task, there was more epenthesis and less deletion by all three experimental condition groups (see Table 5.1). The dictation task on the other hand showed mixed performances by the three experimental condition groups. The traditional method group had equal performance with difference of 15.2% on both epenthesis and deletion, while the listening + orthography group had more epenthesis 18% and less deletion 17.2%. The listening only group had more deletion and less epenthesis (see Table 5.6).

Additionally, in the present study, there were increased effects of orthographic forms which affected the Tera/Hausa learners' productions and/or spelling as was predicted. This was revealed in their oral production mostly in the reading task of silent letters which had no phonemic value. For instance, the silent grapheme <k> in ***knife*** /naɪf/ was pronounced [**k**inaɪf] and <p> as a silent singleton in ***pneumonia*** /njuːməʊniə/ pronounced [**p**enɪmonɪa], whereas as a digraph in ***phone*** /fəʊn/ it was pronounced [pon]. Notice that for the silent letter production, there is also epenthesis of a vowel, e.g. in *pneumonia*. On the contrary, in the dictation written production, deletion of the silent letters occurred. The learners spelled the words containing silent letters as they heard them being spoken on the audio tape by a native speaker. For instance, ***knife*** spelled <nife> without <k>, ***wristwatch*** spelled <ristworch> without <w> and so on. These findings conform to other studies that show the effect of orthographic forms in learners' spelling pronunciation of L2 forms that do not conform to their L1 forms. As discussed in Chapter Three, Bassetti (2008) notes that orthographic input provides a visual and permanent analysis of the auditory input which may compliment a defect in their perception of the L2 forms and as a result produce the phonemes that they find difficult to perceive, for instance production of the phoneme /b/ in words like ***climb*** and ***debt*** where the /b/ is silent. This is demonstrated in Bassetti and Atkinson's (2015) study on the effect of orthographic forms on the pronunciation of young adult Italian native-speakers who were experienced instructed L2 learners of known words. In their first study in a series of four studies, the authors examined the effect of orthography-induced epenthesis of silent letters by 14 high-school Italian speaking L2 English learners ages 16 - 19. They checked to see the level at which the learners will add

epenthetic consonants because of the spelling so as to correspond with the silent letters. Their results show a high percentage of phone additions due to the effect of orthography despite the fact that the learners have acquired the L2 at an early age. The learners in their study produced all the four tokens containing silent <b> (climb, comb, debt, lamb) in the reading aloud task. They also observed that although /mb/ and /bt/ are not a permissible cluster in English, but almost all the learners produced them as a cluster in the tokens containing these sequence. Also, in the repetition task, there was the production of the phoneme [l] by 71% of the participants in their study when they repeated ***walk***. Also, as earlier mentioned, in Young-Sholten *et-al's* (1999) study, the absence of orthography led to deletion just as seen in the present study in the dictation task.

Furthermore, when examining the findings on the learners' production and perception of some words containing consonant clusters that are loanwords from English-Hausa-Tera, it was observed that the learners resolved the clusters by the epenthesis of a vowel so that the syllable cluster will conform to their L1 structures. Because these loanwords have been adapted into the language, it became part of the vocabulary of the L1, and speakers tend to produce such L2 words as they would produce them in the L1. This is seen for instance in the learner's oral productions of ***tank*** /tæŋk/ pronounced [taŋk**i**], and ***bench*** /benʧ/ pronounced [benʧ**ɪ**]. This also occurred in their dictation written production, with ***tank*** spelled <tanki> and ***bench*** spelled <benci> or <benchi>. This finding is consistent with previous studies discussed in Chapter Three. For example, Jaggar (2001), Alqahtani and Musa (2015) showed that Hausa speakers use vowel epenthesis as a repair strategy when faced with loanwords that have complex syllable structures that do not conform to their L1 syllable structures. For instance, Hausa speakers' vowel epenthesis of English loanwords that contain a cluster e.g. *bread → burodi*, *driver → direba*, *allowance → alawus*. As seen in this study, the learners who are bilingual speakers of Tera and Hausa transferred the influence of their L1 syllable structures on the loanwords and epenthesised vowels to resolve consonant clusters. Interestingly, even though the learners typically treated the loanwords as predicted using vowel epenthesis, the loanword 'screwdriver' was treated differently. Most of the learners did not write or produce ***screwdriver*** with its Hausa loanword form <sukudireba> [sukudireba]. Rather, it was written and produced as <schooldriver> [skuːldraɪvə][30].

[30]As mentioned in section 5.2.1.1.6., it is a common way for many people in Nigeria, especially in the north mostly among the lower class/low educated people to produce ***screwdriver*** as ***schooldriver***. The learners' production was not mistaken for its loanword form <sukurudireba>. This is because, they equally spelled it as ***schooldriver*** in the dictation task.

In sum, in agreement with previous research, there was evidence that the Tera/Hausa learners employed different repair strategies to resolve L2 complex structures that do not conform to their L1 structures. Next is the discussion on the effect of proficiency level on the learners' performance.

6.5 The relevance of proficiency level on learners' performance

The present study predicted that learners with higher proficiency level would improve more in the perception and production tasks on all the experimental condition groups. The results revealed that the beginner-level learners i.e. the lower proficiency level based on OQPT scores of all the three experimental condition groups outperformed the elementary-level and breakthrough-level learners on the epenthesis task. And just, on the reading aloud task, the listening + orthography group and the traditional teaching method group. On the other hand, the elementary-level learners i.e. higher proficiency level based on OQPT scores outperformed the breakthrough-level and beginner-level learners in all the three experimental condition groups on the picture-naming task, and just the listening + orthography group and traditional teaching method group on the dictation task. Also, the elementary-level learners of the listening-only group outperformed the other groups on the reading task. As for the breakthrough-level learners, they only outperformed the other proficiency levels in the listening-only group on the dictation task. It is obvious therefore to say that the 'race' for improvement by the proficiency levels in this study was mainly by the beginner-level learners and the elementary level learners (the lowest and the highest proficiency levels in the study). In view of that, the results do not seem to support the prediction of the study completely, seeing that the learners with higher proficiency level did not always outperform the lower proficiency level learners as predicted. There was a scattered improvement across the tasks by the different proficiency levels in all the three experimental condition groups which was also revealed in their error reduction rates by proficiency levels in section 5.2. Additionally, the learners' proficiency levels did not play a role in their improvement compared to the effect of instruction. This shows only partial conformity to the review of previous studies discussed in Chapter Three. For example, Carell's (1991) study among 75 L1 English learners of L2 Spanish and 45 L1 Spanish learners of L2 English which examined whether learners' L2 reading ability will be affected by both their L1 reading ability and their L2 proficiency. The learners in the study were all of different proficiency levels. The proficiency levels of Spanish native speakers learning English included: level 3 (intermediate intensive ESL), level 4 (advance intensive), and level 6 (university level composition). On the other hand, the proficiency levels of English native

speakers learning Spanish included: level 2 (first year Spanish 2nd semester), level 3 (second year Spanish 1st semester), and level 4 (3rd year Spanish grammar and composition). The results showed that L1 reading ability as well as L2 proficiency level contributed to the learners' reading ability. In other words, there were significant effects on reading ability based on L1 reading and L2 proficiency levels. Also in another study, Vandergrift (2006) examined the listening ability of native English-speaking students learning French in two listening comprehension tests in French and in English in order to check their listening ability in processing samples of extended spoken language in real-time. The study was conducted among 75 adolescent English-speaking grade 8 students in Canada, between ages 14-15 years. Their proficiency levels consisted of higher ability group with 11 students whose level of French proficiency was higher and the beginner-level group with the remaining 64 students who were beginner-level proficient in French. In this study, both L1 listening ability and L2 proficiency contributed significantly to the learners listening comprehension ability. A much better predictor for the learners' listening comprehension was the L2 proficiency rather than L1 listening ability.

In this case, given the results of this present study on the effects of proficiency levels on the learners' performance, we could conclude that there is only a partial conformity with the previous literature discussed in Chapter Three. Because in the previous studies, we have seen improvement due to both factors, i.e. L1 reading ability and L2 proficiency in Carell's (1991) study, and L1 listening ability and L2 proficiency in Vandergrift's (2006) study. Although in the present study two factors were considered in measuring the learners' improvement i.e. by the effect of instruction and the effect of proficiency level. However, as previously mentioned in the discussion on the effects of instruction in section 6.3, proficiency level played a lesser role in the learners' improvement than did instruction method.

In the following section, we will be discussing the correlation between production and perception in regards to the prediction of the study in relation to previous studies.

6.6 The relationship between production and perception

Another prediction of this study was that there would be correlation between the perception and production performance of the learners. The findings in this study revealed that there were significant positive correlations between production and perception tests as recorded in the results in Chapter Five section 5.5, $p \leq 0.001$. Positive correlations were seen across the various tests (i.e perception pre-test and production pre-test, $r = 0.695$, $p = 0.001$, perception pre-test

and production post-test $r = 0.637$, $p = 0.001$, perception post-test and production pre-test, $r = 0.774$, $p = 0.001$, and perception post-test and production post-test, $r = 0.758$, $p = 0.001$. These findings are consistent with previous empirical studies in L2 production and perception that provided evidence for the positive correlation that exists between production and perception as discussed in Chapter Three. For example, Flege's (1993) study on vowel duration cues in the distinction of word final English /t/ and /d/ among Chinese/English bilinguals revealed significant correlation between production and perception, $r = 0.54$, $p < 0.05$. In the same way, Flege, Bohn and Jang's (1997) study on the production and perception of English vowels by Spanish, German, Mandarin and Korean adult native speakers revealed significant correlation between production and perception, $r = 0.52$, $p < 0.05$. Likewise, in another study, Flege, Mackay and Meador (1999) discovered that highly experienced Italian L2 learners of English living in Canada revealed significant correlation between their results on production accuracy of English vowels and perceptual ability in discriminating English vowels, $r = 0.62$, $p < 0.05$. Production-perception correlation is also revealled in Saito and Poeteren's (2017) study among 45 Japanese learners of English /ɹ/ performance. These learners were studying at a private institution in Japan or volunteering neighbouring universities and colleges in Japan. Their results revealed strong correlation for the perception scores and spontaneous production performance accuracy $r = -0.405$ and intelligibility $r = 0.432$), and between perception scores and controlled production (accuracy $r = -0.628$ and intelligibility $r = 0.589$). Saito and Poeteren discovered that the performance of the Native Japanese speakers' word initial /ɹ/ showed a relationship between L2 production and perception in relation to global qualities of accuracy and intelligibility. As is the case for this study and as clearly seen in the findings from previous studies reviewed, correlations exist between L2 production and perception. For the present study, a possible factor that may have resulted in the positive correlations could have been with the instruction methods. Flege (1999) suggested that methodological factors could contribute to the modest correlations observed in L2 segmental production and perception studies.

Having discussed the findings of this study in relation to the previous studies, we will now turn to look at the implications of these findings for L2 pronunciation instruction in Nigeria's secondary schools.

6.7 Pedagogical implications of the study for L2 pronunciation instruction in Nigeria

The findings of this study recorded significant improvements on the learners' performance by the effect of instruction as seen in Chapter Five and as also discussed in the previous sections

in this chapter. Having given these findings, a further question arises: What are the pedagogical implications?

The present study clearly shows that teaching pronunciation using the traditional teaching method which is currently the norm should not be completely written off, even though it is flawed. The findings of this study suggest that the teaching and testing of pronunciation in Nigeria needs to be revisited. As discussed in Chapter Two on the teaching of L2 pronunciation in Nigeria, many teachers of pronunciation are not competent and do not form the right models for the contrast being tested in the oral English exam. Although in this study, the traditional teaching method group did improve, but more improvement was shown by the listening + orthography group. This shows that using recordings of a native speaker in instruction played a crucial role. Recall in the previous literature discussed in Chapter Three section 3.6 it was noted that there was a time in Nigeria when pronunciation teaching was done using recorded native speaker modelled lessons. Those were the times when the standard of written and spoken English of the students was at its height and cannot be compared with the standard of English that we have today.

Importantly, since the present study has recorded significant improvement by learners who received instruction via using recorded native speaker phonological input + orthography, this points to the relevance of developing effective pronunciation instruction materials. Focus should be on the potentially important role that native speaker phonological input plays in L2 English pronunciation instruction. Hence, it is suggested that the education authorities that are responsible for curriculum design and planning methodologies should revisit the methods of oral English instruction in Nigeria's secondary schools, taking into consideration the contrast that is tested. Most crucially, the education authorities need to invest in the training and retraining of English teachers on L2 English pronunciation teaching. This is crucial for the development of the teachers to become good models for oral English instruction and in turn, the standard of students' written and spoken English could begin to rise once again.

To conclude, although in the present study, learners' proficiency levels did not completely play a role in their improvement as much as the effect of instruction, its effect cannot totally be disregarded. It is suggested that teachers should pay attention to the oral English learning needs of students based on their proficiency levels, especially lower levels as they could record most improvement as seen in the results of the present study. In the next chapter, the conclusion, recommendations and future directions for this study are presented.

Chapter 7: Conclusion

7.1 Introduction

In the previous chapter, the discussion of the findings of this study were provided in relation to the hypotheses and previous literature presented in this thesis. Links were made between the findings and the literature to show the conformity or non-conformity of the findings to the previous literature. In this chapter, a general discussion of the contribution of the study is provided in section 7.2, followed by the limitations of the study in 7.3. The implications of the findings of the study are provided in 7.4 and in section 7.5 suggestions for directions for future research are provided based on the issues arising from this study.

7.2 Contribution of the research

This study has contributed to our knowledge on the effects of orthographic and phonological input in L2 phonological acquisition among Tera/Hausa learners in north east Nigeria. First, a description of the cross linguistic characteristics of the languages used by the learners i.e. Tera, Hausa and English provided a baseline information for the discussion on various aspects of L2 English phonology and acquisition. A comparison between English phonology with those of Tera and Hausa shows that English has more complex syllable structures than both Tera and Hausa which have CV, CVV, and CVC structures. As for the orthography, although all three languages use the Roman alphabet, English has more graphemes representing its phonemes than both Tera and Hausa. This results in difficulty for the Tera/Hausa learners of L2 English. In this study, we saw that the learners resolved these complex L2 English syllable structure that are not in their L1 by either inserting a vowel, deleting a consonant or metathesizing of segments to conform to their L1 syllable structures.

Additionally, the experiments conducted in this study have provided evidence that confirmed the findings in previous research on the effects of instruction in L2 pronunciation. The results of the experiments supported the use of recorded native speaker aural input + orthographic input during instruction rather than using only recorded native speaker aural input without any orthography, or traditional teaching method with non-native speaker input. Although as seen in Chapter Five that while the results of the listening + orthography group yielded better improvement than the listening only group or the traditional teaching method group, improvement by the traditional teaching method group was next to the listening + orthography group, therefore, the traditional teaching method should not be written off as a teaching method, but should be complemented by the listening + orthography method.

Furthermore, the findings in this thesis have provided evidence for the effect of orthographic input on the learners' production and/or spelling which conforms to the findings from previous studies. As seen in the study, orthographic forms led to the learners' orthographic production of silent singletons that have graphemic quality but no phonemic quality when presented with the orthography in the reading aloud task. On the other hand, in the dictation task when the orthography was absent, they resolved to delete the graphemes.

As mentioned in Chapter One section 1.3 on the contribution of this study, studies have been conducted on the teaching of English in Nigeria but none focused on L1 Tera speakers, or on the effect of orthographic input in L2 phonological acquisition by Tera speakers. In addition, it was also stated that there is increased interest in research on L2 phonological acquisition and orthographic input in recent years. As such, this study adds to the body of knowledge by firstly, providing empirical evidence about Tera/Hausa speakers' production and perception of L2 English. Secondly, providing evidence for the effect of orthographic input in L2 English pronunciation instruction. Thirdly, it is hoped that the study will make other researchers see and explore other areas of research in Tera being a minority and understudied language.

7.3 Limitations

Due to the limitation imposed by the age group of the participants and the amount of same schooling experience required for the participants (JSS 3 students only), the total number of the participants for the study could not be recruited from one school and therefore had to be recruited from two schools in neighbouring communities (Difa and Zambuk).

In addition, a delayed post-test could not be conducted due to the complexity with the whole procedure for data collection of which research assistants were used for the data collection. Another reason was due to the activities of the Boko Haram which prompted the government to close down schools briefly whenever there was an attack in Gombe state or in the neighbouring Borno or Yobe states. In fact, during the second week of the data collection, schools in Gombe state were closed down for two school days due to Boko Haram attacks in Gombe state. This did not affect the data collection because there were just two days of contact with the groups in each week and the closure was not on the day of the meeting. The whole process was thus conducted in highly stressful circumstances. Also, as discussed in section 4.3.6, unreliable power supply rendered the laptop impractical to use Power Points for the study as was originally designed. However, this challenge was resolved by printing the power point slides and using of flip charts.

7.4 Implications

This study has shown the role of the effects of native speaker aural input during instruction. And as noted in Chapter Three section 3.6 on teaching of L2 pronunciation in Nigeria, the standard of the written and spoken English of students has declined and cannot be compared to the standard of students during the colonial periods or even shortly afterwards. Those were the era when recorded pronunciation instruction using native speaker models were used for teaching pronunciation in the secondary schools. This calls for the strengthening of the educational system especially in the aspect of oral English instruction which could foster the students' written as well as spoken English. I would therefore recommend that an interrogation of the oral English curriculum in Nigeria's secondary schools should be conducted focusing firstly, on the method of instruction. As noted in this study that oral English instruction has been left at the mercy of the non-native speaker teacher of English who may or may not have the qualification to teach oral English. What is more is that the non-native speaker teacher may also have their L1 influence which could alter with the contrast that is being taught and tested. Therefore, it is recommended that improved methods of teaching oral English like the one used in this study with the listening + orthography group should be employed in the secondary schools. In other words, recorded native speaker models of the oral English curriculum should be used to accompany the traditional teaching method. Since language laboratories which were used in the schools are no longer in use, the use of modern technologies e.g. audio players, (like used in this present study) or computer programmes (since there are now computer labs in the schools) should be encouraged. In addition, the content of the oral English curriculum should be reviewed whereby the contrast and accent (i.e. either British English or American English) being tested is clearly defined and it should tally with the native-speaker records that would eventually be used. Also, the content could include pronunciation practice activities whereby the students get to constantly practice during the oral English lessons.

Secondly, a review of the testing should be conducted. The nature of oral English testing as reported in Chapter Three section 3.6, has always been carried out in objective tests without any perception or performance test, (Ufomata 1996). With this kind of testing, it is obvious that the objective of teaching oral English in the schools which requires the students to produce and perceive English segmentals and suprasegmentals is not achieved. It is therefore recommended that the government should invest in seeing that the testing procedure is reviewed, such that the students can be tested on both production and perception of English segmentals and suprasegmentals. If the recommendation in the previous paragraph is considered i.e. including

pronunciation practice activities during oral English lessons, then it could be a preparatory phase for the production test for the students.

Thirdly, since a great deal of the input comes from the non-native speaker English teacher, it is recommended that the training needs of the teachers should be met as obviously, they cannot give what they do not have. Therefore, the government should invest in the training and retraining of teachers of English focusing on all the aspects of the curriculum in order to boost the quality of the teachers and the students' performance. While the government is doing that, they could also consider improving the infrastructures in the schools including building computer labs in all secondary schools, reduce class size and provide the necessary tools that are required for the effective teaching and testing of oral English in Nigeria's secondary schools.

7.5 Suggestions for future research

This study has attempted to provide knowledge about production and perception of L2 English by Tera speakers, however, more investigation is needed in the aspect of L2 English acquisition by the speakers. As noted earlier in this thesis, Tera is a minority and understudied language, the findings in this study in respect to the L2 phonological acquisition in complex syllable structure repair strategy used by Tera/Hausa speakers will be further investigated. In particular, the /sk/ segment in L2 English was problematic for the learners such that not only did they metathesize the segments in production, but they also metathesized in their dictation elicited written production. Potentially, I would check whether Tera speakers would be able to produce other /sk/ sequences in onset position e.g *sky*, *skull* and coda position e.g. *desk*, *mask*.

The emphasis in this study is on L2 English production and perception. Doing this study as a Tera speaker myself made me realise that as much as emphasis is laid on L2 production and perception, there is need for promoting production and perception of Tera orthography and pronunciation. Therefore, a prospective area of research will be to check whether young vs older Tera speakers can produce and perceive Tera orthography vs phonology in a similar study to this one. This is due to the reason that the new orthography of Tera has only been developed in 2008 and as stated in Chapter Two section 2.2, Tera language is mainly used by the speakers in family and village life and also in radio broadcasting of news locally in Gombe. Tera is not used in education which could help promote the use of the orthography especially among school going speakers of the language. Therefore I would check if Tera speakers would be able to effectively write using Tera orthography upon listening to it spoken by a native speaker and also if they can effectively read Tera based on the new orthography.

Additionally, recall in Chapter Two section 2.2.1.3 on the syllable structures of Tera, I mentioned that because of the theory of the onset principle, Tera could not have onsetless syllables and thus behave like Hausa when a word begins with a vowel. Another potential study would be to conduct an empirical study among Tera speakers in order to find evidence for the occurrence of an onset (a glottal stop) in words beginning with a vowel in the orthographic form in order to support the onset principle and my claim that there are no onsetless structures in Tera.

This study focused on segmental items, however an important factor in speakers' intelligibility is prosody, in particular main stress along with rhythm and intonation. This is another prospective area for future research.

Glossary

Consonant cluster: the combination of a sequence of consonants found at the beginning of a syllable, i.e. in the *onset,* or at the end of the syllable in the *coda*.

Diphthongs: vowels that involve a change of quality of one vowel moving to another vowel. There are two groups of diphthongs, the closing diphthongs that end in [ɪ] e.g. [eɪ, aɪ, ɔɪ], and those that end in [ʊ] e.g. [aʊ, əʊ], and the centring diphthongs those that end in [ə] e.g. [ɪə, ɛə, ʊə].

Frontness: this determines the position of the tongue whether it is moving towards the front of the mouth to the lips, the middle of the mouth or the back of the mouth towards the throat resulting in front vowels [ɪ, iː, ɛ, æ], central vowels [ə, ɜː, ʌ] and back vowels [ɑː, ɒ, ɔ, ʊ, uː] respectively.

Gemination: are long consonants which are also called double consonants

Greek letters represented by α and β: are used for specifying features that can be independent without affecting other features. They are used to replace the value of regular feature specification which means *either* '+' or '-'.

***Height*:** this determines the distance of the tongue whether it is raised at the roof of the mouth, middle of the mouth or at the lower jaw resulting into high vowels [ɪ, iː, ʊ, uː], mid vowels [ɛ, ə, ɜː, ɔ] and low vowels [æ, ʌ, ɑː, ɒ].

Labialization: a secondary articulation which in general involves any noticeable lip-rounding or potrusion of the lips

Obstruents: are a class of consonants that are produced with restriction of the airflow where the articulators are in complete closure or in close approximation (e.g. oral stops, fricatives and affricate).

Penultimate syllable: This is the next to the last syllable in a word.

Palatalization: a secondary articulation involving movement of the tongue towards the hard palate in the production of a sound which is normally produced in other positions.

Phonotactics: the ristriction of phonemes that can go together at the beginning, middle or end of a syllable.

Roundness: this deals with the behaviour of the lips during the production of the vowels. The lips are either rounded in the production of [uː, ʊ, ɔ, ɒ] or unrounded (also called spread) in the production for the other vowels.

Sonorants: are a class of sounds that show a clear formant pattern (e.g. vowels, nasals, glides and liquids)

Bibliography

Abercrombie, D. (1949). Teaching pronunciation. *ELT Journal*, *3*(5), 113-122.

Abubakre, S.O. (2008) 'Domestication of Arabic Loanwords in Hausa for National Development', *Al-Hikmah, Journal of the Humanities, Ilorin: Al-Hikmah University*, Vol. 1(1), 77-93.

Aduwa-Ogiegbaen, E., and Iyamu, O. E. (2006). Factors affecting quality of English language teaching and learning in secondary schools in Nigeria. *College Student Journal*, Vol. 40 (3), 495-504.

Ale, S.O. (1981) Difficulties facing Mathematics teachers in Developing countries: A case study of Nigeria. *Educational Studies in Mathematics* Vol. 12 (4), 479-489

Alimi, O. S., Ehinola, G. B., & Alabi, F. O. (2012). School types, facilities and academic performance of students in senior secondary schools in Ondo State, Nigeria. *International Education Studies*, Vol. 5 (3), 44-48.

Alqahtani, M., & Musa, R. (2015). Vowel epenthesis in Arabic loanwords in Hausa. *International Journal of Linguistics*, Vol. 7 (2), 62-80.

Altmann, H., & Kabak, B. (2010). Second language phonology. In Kula, N., Botma, B., Nasukawa, K., (Eds). *Continuum Companion to Phonology. London: Continuum*, 298-319.

Amuseghan, S. A. (2007). ESL Curriculum in Secondary Schools in Nigeria: Issues and Challenges towards Communicative Competence. *Nebula*, Vol. 4 (2), 319-333.

Anderson, J. (1987). The markedness differential hypothesis and syllable structure difficulty. *Interlanguage phonology: The acquisition of a second language sound system*, 279-291.

Archangeli, D., & Pulleyblank, D. (1989). Yoruba vowel harmony. *Linguistic Inquiry*, Vol. 20 (2), 173-217.

Archibald, J. (1993). *Language Learnability and L2 phonology: The Acquisition of Metrical Parameters*. Kluwer Academic Publishers.

Archibald, J. (1998). *Second language phonology* (Vol. 17). Amsterdam: John Benjamins Publishing.

Atanda, A. I., & Jaiyeoba, A. O. (2011). Effects of school-based quality factors on secondary school students' achievement in English language in South-Western and North-Central Nigeria. *Journal of Emerging Trends in Educational Research and Policy Studies*, Vol. 2 (2), 93-99.

Bamgbose, A. (2004). Language of instruction policy and practice in Africa. *Dakar, Senegal: Regional Office for Education in Africa, UNESCO*.

Bassetti, B. (2008). Orthographic input and second language phonology. In T. Piske and M. Young-Scholten (eds.), *Input Matters in SLA*. Clevedon, UK: Multilingual Matters. 191-206

Bassetti, B. (2012) Sound and spelling. In C.A. Chapelle (Ed.). *The Encyclopedia of Applied Linguistics*. Oxford: Wiley-Blackwell. 5312-5317

Bassetti, B. & Atkinson, N. (2015) Effects of orthographic forms on pronunciation in experienced instructed second language learners. In R. Hayes-Harb, B. Bassetti, & P., Escudero (Eds.), Orthographic effects in second language phonology. Special issue. *Applied Psycholinguistics,* Vol. 36 (1), 67-91

Bassetti, B., Escudero, P., & Hayes-Harb, R. (2015). Second language phonology at the interface between acoustic and orthographic input. *Applied Psycholinguistics*, Vol. 36 (1), 1-6.

Best, C. T. (1994). Learning to perceive the sound pattern of English. In C. Rovee-Collier, and L.P. Lipsitt (Eds). *Advances in Infancy Research*. Hillsdale NJ: Ablex. 31 - 80

Best, C. T. (1995). A direct realist perspective on cross-language speech perception. In W. Strange (Ed). *Speech Perception and Linguistic Experience: Theoretical and Methodological Issues in Cross-language Speech Research*. York: Timonium, MD. 167-200.

Best, C. T., McRoberts, G. W., & Goodell, E. (2001). Discrimination of non-native consonant contrasts varying in perceptual assimilation to the listener's native phonological system. *The Journal of the Acoustical Society of America,* Vol. 109 (2), 775-794.

Bialystok, E. (1994). Analysis and control in the development of second language proficiency. *Studies in second language acquisition,* Vol. 16 (02), 157-168.

Birdsong, D. (Ed.). (1999). *Second language acquisition and the critical period hypothesis*. Mahwah, New Jersey: Lawrence Erlbaum Associates Publishers.

Blachman, B. A. (2000). Phonological awareness. *Handbook of Reading Research*, (Vol. 3), 483-502.

Bongaerts, T. (1999). Ultimate attainment in L2 pronunciation: The case of very advanced late L2 learners. In D. Birdsong (Ed). *Second language acquisition and the critical period hypothesis*. Mahwah, New Jersey: Lawrence Erlbaum Associates Publishers, 133-159.

Broselow, E., Chen, S.I., and Wang, C. (1998). The emergence of the unmarked in second language phonology. *Studies in Second Language Acquisition* (Vol. 20), 261–80.

Carr, P. (2013). *English Phonetics and Phonology: an introduction*. Second Edition. Oxford: Wiley-Blackwell.

Carrell, P. L. (1991). Second language reading: Reading ability or language proficiency? *Applied Linguistics*, Vol. 12 (2), 159-179.

Carney, E. (1994). *A Survey of English Spelling*. Routledge.

Caron, B. (2011). Hausa grammatical sketch. In A. Mettouchi, M. Vanhove, and D. Caubet (Eds). *The CorpAfroAs Corpus. ANR CorpAfroAs: a Corpus for Afro-Asiatic languages*.

Champagne-Muzar, C., Schneiderman, E. I., & Bourdages, J. S. (1993). Second language accent: The role of the pedagogical environment. *IRAL: International Review of Applied Linguistics in Language Teaching*, Vol. 31 (2), 143-160

Cohen, J. (1988). Statistical power analysis: A computer program. London: Routledge.

Couper, G. (2006). The short and long-term effects of pronunciation instruction. *Prospect: an Australian Journal of TESOL*, Vol. 21 (1), 44-64.

Crystal, D. (2011). *A Dictionary of Linguistics and Phonetics*. Sixth Edition. Oxford: Blackwell Publishing

Crystal, D. (2012). *Spell it out: The Singular Story of English Spelling*. London: Profile Books.

Davenport, M., & Hannahs, S.J. (2010). *Introducing Phonetics and Phonology*. Third Edition. London: Routledge.

Denes, P.B. and Pinson, E.N., (1993). *The Speech Chain: The Physics and Biology of Spoken Language.* New York: W. H. Freeman and Company.

DeKeyser, R. (2003). Implicit and explicit learning. In M. Long & C. Doughty (Eds) *Handbook of second language acquisition*. Malden, MA: Blackwell. (313–348)

Derwing, T.M., Munro, M.J., & Wiebe, G. (1998). Evidence in favor of a broad framework for pronunciation instruction. *Language Learning*, Vol. 48 (3), 393-410.

Derwing, B.L, Priestly, M.S., & Rochet, B.L. (1987). The description of spelling-to-sound-relationships in English, French and Russian: Progress, problems and Prospects. In P.A. Luelsdorff (Ed). *Orthography and Phonology*. Amsterdam: John Benjamins Publishing, 13 - 52

Derwing, T. M., & Munro, M. J. (2005). Second language accent and pronunciation teaching: A research-based approach. *Tesol Quarterly*. Vol. 39 (3), 379-397.

Dustan, E. (1969). *Twelve Nigerian Languages.* New York: Africana Publishing Corporation

Eckman, F.R. (1977). Markedness and contrastive analysis hypothesis. *Language Learning*, (Vol .27), 315-330.

Eckman, F.R. (1985). Some theoretical and pedagogical implications of the markedness differential hypothesis. *Studies in Second Language Acquisition*, Vol. 7 (3), 289-307.

Eckman, F.R., & Iverson, G.K. (1994).Pronunciation difficulties in ESL: Coda consonants in English interlanguage. In M. Yavas (Ed.) *First and Second Language Phonology*. San Diego, CA: Singular, 251-265

Eckman, F., Iverson, G., Fox, R.A., Jacewicz, E. and Lee, S. (2009). Perception and production in the acquisition of L2 phonemic contrast. In M.A. Watkins, A.S. Rauber, and B.O. Baptista (Eds). *Recent Research in Second Language Phonetics/Phonology: Production and Perception.* UK: Cambridge Scholars Publishing, 81-85

Ellis, R. (2006). Current issues in the teaching of grammar: An SLA perspective. *TESOL Quarterly*. Vol. 40 (1), 83–107.

Escudero, P., Hayes-Harb, R., & Mitterer, H. (2008). Novel second-language words and asymmetric lexical access. *Journal of Phonetics*, Vol. 36 (2), 345-360.

Eshiet, O. I. (2014). Synthetic phonics as a tool for improving the reading skills of Nigerian pupils. PhD Thesis Newcastle University

Fabunmi, M. Brai-Abu, P. and Adeniji, I. A. (2007). Class factors as determinants of secondary school student's academic performance in Oyo state, Nigeria. *Journal of Social Sciences* Vol. 14 (3), 243-247

Fakeye, D. (2010). Students' personal variables as correlates of academic achievement in English as a second language in Nigeria. *Journal of Social Sciences*, Vol. 22 (3), 205-211.

Fisiak, J. (1991). *Further insights into contrastive analysis* (Vol. 30). John Benjamins Publishing.

Flege, J.E. (1992). The intelligibility of English vowels spoken by British and Dutch talkers. In R.D. Kent (Ed). *Intelligibility in Speech Disorders.* Amsterdam: John Benjamins Publishing.

Flege, J.E. (1993). Production and perception of a novel, second-language phonetic contrast. *Journal of the Acoustical Society of America*, (Vol. 93), 1589-1608.

Flege, J.E. (2003). Assessing constraints on second-language segmental production and perception. In A. Meyer and N. Schiller (Eds) *Phonetics and Phonology in Language Comprehension and Production: Differences and Similarities*. Berlin: Mouton de Gruyter. 319-355.

Flege, J. E. (1995). Second-language speech learning: Theory, findings, and problems. In W. Strange (Ed). *Speech Perception and Linguistic Experience: Theoretical and Methodological Issues*. York: Timonium, MD, 233-272.

Flege, J. E., Munro, M. J., & MacKay, I. R. (1995). Effects of age of second-language learning on the production of English consonants. *Speech Communication*, Vol 16 (1), 1-26.

Flege, J.E., Bohn, O-S., & Jang, S. (1997). The production and perception of English vowels by native speakers of German, Korean, Mandarin, and Spanish. *Journal of Phonetics*, Vol. 25 (4), 437-470.

Flege, J. E., MacKay, I. R., & Meador, D. (1999). Native Italian speakers' perception and production of English vowels. *The Journal of the Acoustical Society of America*, Vol 106 (5), 2973-2987.

Fox, B., & Baker, R. (1980). The acquisition of grapheme-phoneme correspondences in a word learning task. *Reading Psychology*, Vol. 1 (3), 156-164.

Gaina, B. (2005). *Labarku Ɗyirap Nu Me Nyimatli* (Twenty stories in Tera language). Gainako Transcript No. 3 (unpublished).

Geranpayeh, A. (2003). A quick review of the English Quick Placement Test. *Research Notes*, (vol. 12), 8-10.

Gordon, R. G., & Grimes B.F. (2005). *Ethnologue: Languages of the World* (Vol. 15). Dallas, TX: SIL international.

Greenberg, J. H. (1941). Some problems in Hausa phonology. *Language*, (Vol. 17), 316-323.

Hanaoka, O. (2007). Output, noticing, and learning: An investigation into the role of spontaneous attention to form in a four-stage writing task. *Language Teaching Research*, Vol. 11 (4), 459-479.

Hancin-Bhatt, B. (2000). Optimality in second language phonology: Codas in Thai ESL. *Second Language Research*, Vol. 16 (3), 201-232.

Harrison B. (1973). *English as a Second and Foreign Language*. London: Edward Arnold.

Hatch, E., & Lazaraton, A. (1991). *The Research Manual. Design and Statistics for Applied Linguistics.* Heinle & Heinle.

Hayes-Harb, R., Nicol, J., & Barker, J. (2010). Learning the phonological forms of new words: Effects of orthographic and auditory input. *Language and Speech*, Vol. 53 (3), 367-381.

Hecht, B.R. and Mulford, R. (1982). The acquisition of a second language phonology: Interaction of transfer and developmental factors. *Applied Psycholinguistics*, (Vol. 3), 313-328.

Hoffman, C. and Schachter, P. (1969). 'Hausa' In E. Dunstan (Ed). *Twelve Nigerian Languages*. New York: Africana Publishing Corporation.

Holm, A., & Dodd, B. (1996). The effect of first written language on the acquisition of English literacy. *Cognition*, Vol. 59 (2), 119-147.

Hume, E. and Johnson, K. (2001) A model of the interplay of speech perception and phonology. In E. Hume and K. Johnson (Eds). *The Role of Speech Perception in Phonology*. London: Academic Press.

Itô, J. (1989). A prosodic theory of epenthesis. *Natural Language & Linguistic Theory*, Vol. 7 (2), 217-259.

Jaggar, P.J. (2001). *Hausa*. Amsterdam: John Benjamins Publishing.

Jaszczolt, K. (2011). Contrastive analysis. In J. Ostman and J. Verschueren (Eds). *Pragmatics in Practice*. Amsterdam: John Benjamins Publishing Company. 111 - 117.

Jenkins, J. (2000). *The Phonology of English as an International Language: New Models, New Norms, New Goals.* Oxford: Oxford University Press.

Jideonwo, A.I. (2004). *Let's Develop Nyimatli Language*. Lagos: Divine Peace Concept Publications Ventures.

Jones, D. (1956). *The Pronunciation of English*. Fourth Edition nineteenth printing. Cambridge: Cambridge University Press.

Johnson, J. S., & Newport, E. L. (1989). Critical period effects in second language learning: The influence of maturational state on the acquisition of English as a second language. *Cognitive Psychology*, Vol. 21 (1), 60-99.

Kenworthy, J. (1987). *Teaching English Pronunciation*. London: Longman Group

Kløve, M. H., & Young-Scholten, M. (2001). Repair of L2 syllables through metathesis. *IRAL-International Review of Applied Linguistics in Language Teaching*, Vol. 36 (2), 103-133.

Krämer, M. (2003). *Vowel Harmony and Correspondence Theory* (Vol. 66). Mouton de Gruyter.

Ladefoged, P., & Johnson, K. (2011). *A Course in Phonetics*. Sixth Edition. Wadsworth: Cengage Learning

Lado, R. (1957). *Linguistics across Cultures*. Ann Arbor, MI: The University of Michigan Press.

Larson-Hall, J. (2009). *A Guide to Doing Statistics in Second Language Research Using SPSS*. London: Routledge.

Lenneberg, E. (1967). *Biological Foundations of Language*. New York: Wiley.

Leung, H. (2012) Child L2 phonology acquisition under the influence of multiple varieties. PhD Thesis Newcastle University.

Lombardi, L. (2003). Second language data and constraints on Manner: explaining substitutions for the English interdentals. *Second Language Research*, Vol. 19 (3), 225-250.

Lowie, W., & Seton, B. (2013). *Essential statistics for applied linguistics*. London: Palgrave Macmillan.

Madi, J., Baro, Y.D., Gaina, B. (2005). *Labar Khar Ɓu Yesu Nu Matta nu Luka Bulaki* (The story of the birth of Jesus written by Matthew and Luke). Jos: Yakson Press.

Maila, J. (2000). *Writings of Jauro Maila.* Nigeria, (Unpublished).

Major, R. C. (2008). Transfer in second language phonology. In G.J. Hansen Edwards and M. Zampini (Eds.) *Phonology and Second Language Acquisition*. Amsterdam: John Benjamins Publishing Company. 63-94.

Munro, M. J., & Derwing, T. M. (2011). The foundations of accent and intelligibility in pronunciation research. *Language Teaching*, Vol. 44 (3), 316-327.

Musa, R.I. (2007). The impediments of teaching oral English in senior secondary schools: A case study of Bauchi state metropolis. PGDE unpublished project, National Teachers Institute Kaduna.

Musa, R.I. (2012). Production and perception of English complex articulation among Tera and Fulani secondary school students. M.A. Dissertation, Newcastle University.

National Policy on Education (2004). Federal Republic of Nigeria. Fourth Edition. Lagos: NERDC Press.

National Population Commission (2010). Federal Republic of Nigeria 2006 Population and Housing Census: Population Distribution by Sex, State, LGA, and Senatorial District. Priority Table (Vol. 3).

Nevins, A. (2010). *Locality in Vowel Harmony*. London: MIT Press.

Newman, P. (1964). A word list of Tera. *Journal of West African Languages*, volume 1 (2), 33-50.

Newman, P. (1970). *A Grammar of Tera*: *Transformational Syntax and Tests*. University of California Publications: Linguistics, Berkeley (Vol. 57).

Newman, P. (1973). Grades, vowel-tone classes and extensions in the Hausa verbal system. *Studies in African Linguistics*, Vol. 4 (3), 297-346.

Newman, P. (1984). Ethnonyms in Hausa. *Studies in African Linguistics*, Vol. 15 (3), 301.

Newman, P. (1986a). Tone and affixation in Hausa. *Studies in African linguistics*, Vol. 17 (3), 249-67.

Newman, P. (1986b). Reduplicated nouns in Hausa. *Journal of African Languages and Linguistics* Vol. 8 (2), 115-132.

Newman, P. and Jaggar, P.J. (1989). Low Tone Raising in Hausa: A Critical Assessment. *Studies in African Linguistics*, Vol. 28 (3), 227–252.

Newman, P. (1969). 'Tera' in M.E. Kropp Dokubu (Ed). *West African Data Sheets*. Leiden: West African Linguistic Society and African Studies Center. Ter 1-5.

Newman, P. (2009). Hausa and the Chadic languages. In B. Comrie (Ed). *The World's Major Languages*. Second Edition. Routledge, 705-723.

Newport, E. L. (1984). Constraints on learning: Studies in the acquisition of American Sign Language. *Papers and Reports on Child Language Development*, 23, l-22.

Norris, J. M., & Ortega, L. (2000). Effectiveness of L2 instruction: A research synthesis and quantitative meta-analysis. *Language learning*, Vol. 50 (3), 417-528.

Nyimatli Language Project. (2015). *Reading and writing Nyimatli (Tera): A proposal for writing the Nyimatli language*. Jos: Nigeria Bible Translation Trust.

Nyimatli language project. (2007). *Lagarkati Shogar Me Nyimatli* (A book for learning Tera language) Jos: Nigeria Bible Translation Trust.

Nyimatli Language and Translation Committee. (2008). *Labar Mbarkandi nu Luka Bulaki.* (A good story written by Luke) Jos: The Seed Company.

Nyimatli Language and Translation Committee. (2016). *Mewar Alqawarang* (The New Testament) Jos: Nigeria Bible Translation Trust and Wycliffe Bible Translation

Odden, D. (2005). *Introducing Phonology*. Cambridge: Cambridge University Press.

O'Grady, W., Dobrovolsky, M., and Katamba, F. (1996). *Contemporary Linguistics*: *An Introduction*. London; New York: Longman.

Okedara, J. T., & Okedara, C. A. (1992). Mother-tongue literacy in Nigeria. *The ANNALS of the American Academy of Political and Social Science*, Vol. 520 (1), 91-102.

Olatunji, S. O. (2012). English Language Teachers' Attitudes to the Promotion of the Standard Nigerian English: A Survey from a Nigerian City. *African Research Review*, Vol. 6 (3), 268-283.

Oller, J. W., & Ziahosseiny, S. M. (1970). The contrastive analysis hypothesis and spelling errors. *Language learning*, Vol. 20 (2), 183-189.

Omodiaogbe, S. A. (1992). 150 years on: English in the Nigerian school system - past, present, and future. *ELT Journal*, Vol. 46 (1) 19-28.

Owoeye, J. S., & Yara, P. O. (2011). Class size and academic achievement of secondary school in Ekiti State, Nigeria. *Asian Social Science*, Vol. 7 (6), 184-189.

Oyama, S. (1978). The sensitive period and comprehension of speech. *Working Papers on Bilingualism*, (Vol. 16), 1-17.

Patkowski, M. (1980). The sensitive period for the acquisition of syntax in a second language. Language Learning, (Vol. 30), 449-472.

Perkell, J. S. (1990). Testing theories of speech production: implications of some detailed analysis of variable articulatory data. In W. J. Hardcastle and A. Marchal (Eds.) *Speech Production and Speech Modelling*. Dordrecht: Kluwer Academic Publishers. 263-283.

Rafat, Y. (2011). Orthography-induced transfer in the production of novice adult English-speaking learners of Spanish (Doctoral dissertation, University of Toronto).

Rafat, Y. (2016). Orthography-induced transfer in the production of English-speaking learners of Spanish. *The Language Learning Journal*, Vol. 44 (2), 197-213.

Remez, R.E. (2001). The interplay of Phonology and Perception considered from the perceptual organization. In E. Hume and K. Johnson (Eds). *The Role of Speech Perception in Phonology*. San Diego: Academic Press, 27-52.

Richards, J. C. (2015). Error analysis: Perspectives on second language acquisition. Routledge

Roach, P. (2009). *English Phonetics and Phonology: A Practical Course*. Fourth Edition. Cambridge: Cambridge University Press.

Rogerson-Revell, P. (2011). *English Phonology and Pronunciation Teaching*. Bloomsbury Publishing.

Rudling, J. (2012). *The Reasons Why English Spelling is so Weird and Wonderful*. London: howtospell.co.uk

Saito, K. (2011). Examining the role of explicit phonetic instruction in native-like and comprehensible pronunciation development: An instructed SLA approach to L2 phonology. *Language awareness*. Vol. 20 (1), 45-59.

Saito, K. (2012). Effects of instruction on L2 pronunciation development: A synthesis of 15 quasi‐experimental intervention studies. *TESOL Quarterly*. Vol. 46 (4), 842-854.

Saito, K. & van Poeteren, K. (2017). The perception–production link revisited: the case of Japanese learners' English /ɹ/ performance. *International Journal of Applied Linguistics.* Vol. 26 (1), 1-15.

Schiavetti, N. (1992). Scalling procedure for the measurement of speech intelligibility. In R.D. Kent. (Ed) *Intelligibility in Speech Disorders.* Amsterdam: John Benjamins Publishing

Schuh, R. G., & Yalwa, L. D. (1993). Hausa. *Journal of the International Phonetic Association*, Vol. 23 (02), 77-82.

Scovel, T. (1988). *A time to speak: A psycholinguistic inquiry into the critical period for human speech*. Rowley, MA: Newbury House Publishers.

Scovel, T. (1969). Foreign accents, language acquisition, and cerebral dominance. *Language learning*. Vol. 19 (3-4), 245-253.

Seidenberg, M. S., Waters, G. S., & Barnes, M. A. (1984). When does irregular spelling or pronunciation influence word recognition? *Journal of Verbal Learning and Verbal Behavior*, Vol. 23 (3), 383-404.

Selinker, L. (1972). Interlanguage. *IRAL-International Review of Applied Linguistics in Language Teaching*, Vol. 10 (1-4), 209-232.

Sheldon, A., & Strange, W. (1982). "The acquisition of /r/ and /l/ by Japanese listeners of English: Evidence that speech production can precede speech perception," *Applied Psycholinguistics*, (Vol. 3), 243-261.

Spada, N., & Tomita, Y. (2010). Interactions between type of instruction and type of language feature: A Meta-Analysis. *Language learning*, Vol. 60 (2), 263-308.

Stockwell, R., & Bowen, J. (1965). *The Sounds of English and Spanish*. Chicago: University of Chicago Press.

Strange, W., (1989). Evolving theories of vowel perception. *Journal of the Acoustical Society of America*. Vol. 85 (5), 2081-2087

Strange, W. and Shafer, L.V. (2008). Speech Perception in Second Language Learners. In H.G.J. Edwards and M. Zampini (Eds). *Phonology and Second Language Acquisition*. Amsterdam: John Benjamins Publishing Company. 153-187.

Sumdangdej, S. (2007). Input and the acquisition of suprasegmental phonology in English by Thai school children. (PhD. Thesis).

Tatham, M. and Morton, K. (2006). *Speech Production and Perception*. New York: Palgrave MacMillan.

Tatham, M. and Morton, K. (2011). *A Guide to Speech Production and Perception.* UK: Edinburgh University Press.

Tench, P. (2007a). 'Tera' *Journal of International Phonetics Association.* Vol. 37 (2) 227-234.

Tench P (2007b). *'A New Orthography in Tera'.* Cardiff University. (Unpublished),

Tiffen, B. (1974). The Intelligibility of Nigerian English. London (PhD. Thesis).

Troike, M. S. (2006). *Introducing second language acquisition*. Cambridge: Cambridge University Press.

Ufomata, T. (1996). Setting priorities in teaching English pronunciation in ESL contexts. In *Seminar presentation as a British Academy Visiting Fellow at University College London*.

Upward, C., & Davidson, G. (2011). *The History of English Spelling*. Malden, MA: Wiley-Blackwell.

Ulijn, J. (1977). An integrated model for first and second language comprehension: And some experimental evidence about the contrastive analysis hypothesis. *System*, Vol. 5 (3), 187-199.

Vandergrift, L. (2006). Second language listening: listening ability or language proficiency? *The Modern Language Journal*, Vol. 90 (1), 6-18.

Vainikka, A. (2013). *English reading and spelling rules for short words*. ms Johns Hopkins Virginia University, WV

Venezky, R. L. (1970). *The structure of English orthography* (Vol. 82). Netherlands: Walter de Gruyter.

Venezky, R. L. (1999). *The American Way of Spelling: The Structure and Origins of American English Orthography*. New York: The Guilford Press

Venkatagiri, H., & Levis, J. (2007). Phonological awareness and speech comprehensibility: An exploratory study. *Language Awareness*. Vol 16 (4), 263–277.

Von Gleich, U. Y and Wolff, E. (1991). *Standardization of National Languages: Symposium on Language Standardization.* Hamburg. UNESCO Institute for Education Report AZM 42/1991.

Wardhaugh, R. (1970). The contrastive analysis hypothesis. *TESOL Quarterly* (Vol. 4) 123–130.

Weinreich, U. (1953). *Languages in Contact.* New York: Linguistic Circle of New York.

Yara, P. O. (2009). Relationship between teachers' attitude and students' academic achievement in mathematics in some selected senior secondary schools in southwestern Nigeria. *European Journal of Social Sciences.* Vol. 11 (3), 364-369

Yule, G. (2006). *The Study of Language*. Cambridge: Cambridge University Press.

Young-Scholten, M., Akita, M., & Cross, N. (1999). Orthographic exposure as a promoter of epenthesis: Focus on form in phonology. In P. Robinson and N.O. Jungheim, (Eds.) *Pragmatics and pedagogy: Proceedings of the Third PacSLRF*. Tokyo: Anyoma Gakuin University. (Vol. 2), 227-233.

Young-Scholten, M., and Hannahs, S.J. (1997). Current issues in the first and second acquisition of phonology. In S.J. Hannahs and M. Young-Scholten (Eds). *Focus on Phonological Acquisition*. Amsterdam: John Benjamins Publishing Company. (Vol 16), 1-14.

Young-Scholten, M. (2002). Orthographic input in L2 phonological development. In P. Burmeister, T. Piske & A. Rohde (Eds.) *An Integrated View of Language Development: Papers in Honor of Henning Wode*. Trier: Wissenschaftlicher Verlag Trier. 263-279.

Young-Scholten, M., & Langer, M. (2015). The role of orthographic input in second language German: Evidence from naturalistic adult learners' production. *Applied Psycholinguistics*, Vol. 36 (01), 93-114.

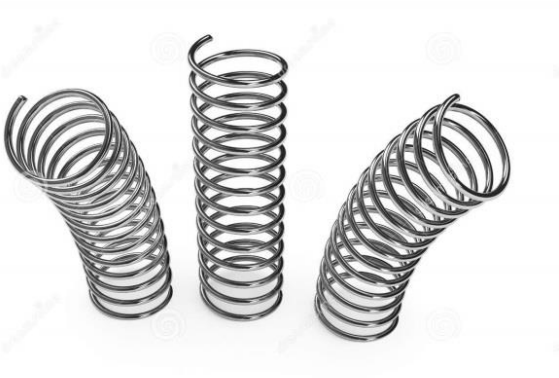
Zampini, M. (2008). L2 speech production research. *Phonology and Second Language Acquisition*, 219-249.

Zobl, H. (1982). A direction for contrastive analysis: The comparative study of developmental sequences. *TESOL quarterly*, 169-183.

Appendix A: ABX Epenthesis task test tokens

	A	B	X
1.	CLOCK	COLOCK	CLOCK
2.	BULOCK	BLOCK	BLOCK
3.	SINAKE	SNAKE	SINAKE
4.	BRUSH	BURUSH	BURUSH
5.	DRUM	DURUM	DURUM
6.	SIPIRING	SPRING	SIPIRING
7.	SITIRAWBERRY	STRAWBERRY	STRAWBERRY
8.	SITIRAW	STRAW	STRAW
9.	SCREWDRIVER	SUCURUDRIVER	SCREWDRIVER
10.	SIQUIRREL	SQUIRREL	SQUIRREL
11.	TABUL	TABLE	TABUL
12.	DESIK	DESK	DESIK
13.	INKI	INK	INK
14.	FENCEI	FENCE	FENCE
15.	TANK	TANKI	TANK
16.	ANTS	ANTIS	ANTS
17.	HANDS	HANIDS	HANDS
18.	LAMUPS	LAMPS	LAMPS
19.	PLANTIS	PLANTS	PLANTS
20.	KINIFE	KNIFE	KINIFE
21.	KNITTING	KINITTING	KNITTING
22.	PNEUMONIA	PUNEUMONIA	PNEUMONIA
23.	WURISTWATCH	WRISTWATCH	WRISTWATCH
24.	WHISTILE	WHISTLE	WHISTILE
25.	WHEELBARROW	WUHEELBARROW	WHEELBARROW
26.	SIGNBOARD	SIGNIBOARD	SIGNBOARD
27.	COMBU	COMB	COMBU
28.	PHONE	PUHONE	PHONE
29.	SHOE	SIHOE	SHOE
30.	SIHIP	SHIP	SIHIP
31.	CIHAIR	CHAIR	CHAIR
32.	TEETHI	TEETH	TEETH
33.	RING	RINGI	RINGI
34.	DUCK	DUCKU	DUCK
35.	CHURCHI	CHURCH	CHURCHI
36.	FRIDGEI	FRIDGE	FRIDGE
37.	BENCH	BENCHI	BENCHI
38.	BRANCHI	BRANCH	BRANCHI
39.	ORANGE	ORANGEI	ORANGE
40.	SYRINGEI	SYRINGE	SYRINGEI

Appendix B: Pictures for picture naming task




INK


003: Spider Plant
005: Scented Geranium
010: Papyrus
009: Cuban Oregano
007: Chives
001: Fiddle Leaf Fig
011: Scotch Moss
004: Prayer Plant
002: Living Stones
012: Pothos


Pneumonia


B27
Rawang
Ipoh
B35
Ijok
Kuala Lumpur
UNISEL


Spark Fun


KIRK KARA


6
5
4
3
2
1

Appendix C: Oxford Quick Placement Test paper based question paper

University *of* Cambridge
Local Examination Syndicate

OXFORD
University Press

School code: _____ Participant code: _____

Name: _____ Date: _____

quick placement test

Version 2

Part 1 (Questions 1- 40) – All students

Time: 30 minutes

Quick Placement Test

Part 1

Question 1 – 5

- Where can you see these notices?
- For questions **1** to **5**, mark one letter **A**, **B** or **C** on your **Answer Sheet**.

			A	B	C
1. YOU CAN LOOK, BUT DON'T TOUCH THE PICTURES					
A► in an office	**B►** in a cinema	**C►** in a museum			
2. PLEASE GIVE THE RIGHT MONEY TO THE DRIVER			A	B	C
A► in a bank	**B►** on a bus	**C►** in a cinema			
3. NO PARKING PLEASE			A	B	C
A► in a street	**B►** on a book	**C►** on a table			
4. CROSS BRIDGE FOR TRAINS TO EDINBURGH			A	B	C
A► in a bank	**B►** in a garage	**C►** in a station			
5. KEEP IN A COLD PLACE			A	B	C
A► on clothes	**B►** on furniture	**C►** on food			

Question 6 –10

- In this section you must choose the word which best fits each space in the text below.
- For questions **6** to **10**, mark **one** letter **A**, **B**, or **C** on your Answer Sheet

THE STARS

There are millions of stars in the sky. If you look **(6)**.....the sky on a clear night, it is possible to see about 3000 stars. They look small, but they are really **(7)**.....big hot balls of burning gas. Some of them are huge, but others are much smaller, like our planet Earth. The biggest stars are very bright, but they only live for a short time. Every day new stars **(8)**.....born and old stars die. All the stars are very far away. The light from the nearest star takes more **(9)**.....four years to reach Earth. Hundreds of years ago, people **(10)**.....stars, like the North Star, to know which direction to travel in. Today you can still see that star.

6.			**A**	**B**	C
A► at	**B►** up	**C►** on			
7.			**A**	**B**	C
A► very	**B►** too	**C►** much			
8.			**A**	**B**	C
A► is	**B►** be	**C►** are			
9.			**A**	**B**	C
A► that	**B►** of	**C►** than			
10.			**A**	**B**	C
A► use	**B►** used	**C►** using			

Question 11 - 15

- In this section you must choose the word which best fits each .space in the texts.
- For questions **11** to **20**, mark one letter **A**, **B**, **C** or **D** on your Answer Sheet.

Good smiles ahead for young teeth

Older Britons are the worst in Europe when it comes to keeping their teeth. But British youngsters **(11)**.....more to smile about because **(12)**.....teeth are among the best. Almost 80% of Britons over 65 have lost all or some **(13)**.....their teeth according to a World Health Organisation survey. Eating too **(14)**.....sugar is part of the problem. Among **(15)**....., 12-year-olds have on average only three missing, decayed or filled teeth.

				A	B	C	D
11.							
A► getting	**B►** got	**C►** have	D► having				
12.				A	B	C	D
A► their	**B►** his	**C►** them	**D►** theirs				
13.				A	B	C	D
A► from	**B►** of	**C►** among	**D►**between				
14.				A	B	C	D
A► much	**B►** lot	**C►** many	**D►**deal				
15.				A	B	C	D
A► person	**B►** people	**C►** children	**D►**family				

Question 16 - 20

Christopher Columbus and the New World

On August 3, 1492, Christopher Columbus set sail from Spain to find a new route to India, China and Japan. At this time most people thought you would fall off the edge of the world if you sailed too far. Yet sailors such as Columbus had seen how a ship appeared to get lower and lower on the horizon as it sailed away. For Columbus this **(16)**.....that the world was round. He **(17)**.....to his men about the distance travelled each day. He did not want them to think that he did not **(18)**.....exactly where they were going. **(19)** ....., on October 12, 1492, Columbus and his men landed on a small island he named San Salvador.
Columbus believed he was in Asia, **(20)**.....he was actually in the Caribbean.

				A	B	C	D
16.							
A► made	B► pointed	C► was	D► proved				
17.				A	B	C	D
A► lied	B► told	C► cheated	D► asked				
18.				A	B	C	D
A► find	B► know	C► think	D► expect				
19.				A	B	C	D
A► Next	B► Secondly	C► Finally	D► Once				
20.				A	B	C	D
A► as	B► but	C► because	D► if				

Question 21 - 30

- In this section you must choose the word or phrase which best completes each sentence.
- For questions **21** to **40**, mark one letter **A**, **B**, **C** or **D** on your Answer Sheet.

21. The children won 't go to sleep .....we leave a light on outside their bedroom.				A	B	C	D
A► except	B ► otherwise	C► unless	D► but				
22. I'll give you my spare keys in case you..... home before me.				A	B	C	D
A► would get	B ► got	C► will get	D► get				
23. My holiday in Paris gave me a great..... to improve my French **accent.**				A	B	C	D
A► occasion	B ► chance	C► hope	D► possibility				
24. The singer ended the concert..... **her most popular song.**				A	B	C	D
A► by	B ► with	C► in	D► as				
25. Because it had not rained for several months, there was a..... **of water.**				A	B	C	D
A► shortage	B ► drop	C► scare	D► waste				
26. I 've always .....you as my best friend.				A	B	C	D
A► regarded	B ► thought	C► meant	D► supposed				
27. She came to live her..... **a month ago.**				A	B	C	D
A► quite	B ► beyond	C► already	D► almost				
28. Don't make such a..... **! The dentist is only going to look at your teeth.**				A	B	C	D
A► fuss	B ► trouble	C► worry	D► reaction				
29. He spent a long time looking for a tie which..... **with his new shirt.**				A	B	C	D
A► fixed	B ► made	C► went	D► wore				
30. Fortunately, ...from a bump on the head, she suffered no serious Injuries from her fall.				A	B	C	D
A► other	B ► except	C► besides	D► apart				

Question 31 – 40

31. She had changed so much that..... anyone recognised her.				A	B	C	D
A► almost	B► hardly	C► not	D► nearly				
32. .....teaching English, she also writes children's books.				A	B	C	D
A► Moreover	B► As well as	C► In addition	D► Apart				
33. It was clear that the young couple were..... of taking charge of the restaurant.				A	B	C	D
A► responsible	B► reliable	C► capable	D► able				
34. The book..... of ten chapters, each one covering a different topic.				A	B	C	D
A► comprises	B► includes	C► consists	D► contains				
35. Mary was disappointed with her new shirt as the colour..... very quickly.				A	B	C	D
A► bleached	B► died	C► vanished	D► faded				
36. National leaders from all over the world are expected o attend the .....meeting.				A	B	C	D
A► peak	B► summit	C► top	D► apex				
37. Jane remained calm when she won the lottery and.....about her business as if nothing had happened.				A	B	C	D
A► came	B► brought	C► went	D► moved				
38. I suggest we..... outside the stadium tomorrow at 8.30.				A	B	C	D
A► meeting	B► meet	C► met	D► will meet				
39. My remarks were..... as a joke, but she was offended by them.				A	B	C	D
A► pretended	B► thought	C► meant	D► supposed				
40. You ought to take up swimming for the..... of your health.				A	B	C	D
A► concern	B► relief	C► sake	D► cause				

Appendix D: Instruction for intervention lessons

Study timeline

Week 1 – Introduction/familiarization, participant recruitment, placement test and pre-test

Week 2 – Randomly divide participants into groups and begin lessons with consonant onsets

Lesson 1 – Two consonant onsets: Cl, Cr, Cn (Consonant + /l/, /r/, /n/)

Lesson 2 – Three consonant onsets: sCC (/s/ + 2 other Consonants)

Week 3 – consonant codas

Lesson 3 – Two consonant codas: Ct, Cd, Cp, Ck (Consonant + /t/, /d/, /p/, /k/)

Lesson 4 – Three consonant codas: /mpt/, /nts/, /mps/, /kst/

Week 4 – silent letters

Lesson 5 – initial silent letters: k_, w_, p_, g_, h_, l_,

Lesson 6 – middle and final silent letters: _t_, _g_, _h_, _b_, _b, _n

Week 5 – digraphs

Lesson 7 – initial and final digraphs: /ch/, /ph/, /sc/, /sh/, /gh/

Lesson 8 – clusters with digraphs: C + ch, C+ ge, C + ph, C + th, CC + th

Week 6 – Revision, post-test and debriefing

The experimental groups

Experimental condition group 1 – LIST + ORTH: participants will listen to the productions of the stimuli/activities while seeing their written forms.

Experimental condition group 2 - LIST: participants will only listen to the productions of the intervention stimuli/activities without seeing their written forms.

Experimental condition group 3 - TTM: participants will be taught using the traditional teaching method that they are used to being taught using lesson notes and chalkboard.

Description of the lessons for the three experimental groups

LIST + ORTH group

Week One 02/02/2015 - 06/02/2015: Consonant onsets

Lesson 1 – Two consonant onsets: Cl, Cr, Cn (Consonant + /l/, /r/, /n/)

Word list: Clay, block, flower, plate, plane, fridge, train, cross, drum, drawer, snap, snail

Time – 20 minutes

The teacher asks the students to sit down comfortably and then introduces the lesson by stating the lesson objectives which is to be able to identify two consonant onsets and pronounce them; and also make words correctly using two consonant onsets. Teacher asks the students what they think a consonant cluster is and after a couple of minutes brainstorming, gives them the definition as follows: consonant clusters are two or more consonants following each other in a sequence and can occupy the beginning, middle or coda position of a word. Teacher then tells the students to listen attentively to the 4 minutes 5 seconds recording being played on the record player while also looking at their orthographic representation being displayed.

Tape script

- Listen to the sounds individually and then as a cluster for the recorded list of words
- Make visible their orthographic representations while the sound file is being played with the clusters underlined e.g. c + l = cl as in <u>cl</u>ay, t + r = tr as in <u>tr</u>ain
- Listen to the list of all the examples of words with two consonant onsets and imitate

Activity

The teacher divides the students into smaller groups and using blank sheets of paper and pens, asks them to write down five words with two consonant onsets after which one member of the group will present it to the rest of the class. The teacher then comments on the group activity.

Conclusion

Teacher concludes the lesson by summarizing what was learnt and asks if there are any questions.

Lesson 2 – Three consonant onsets: sCC (/s/ + 2 other Consonants)

Word list: Scratch, scream, scroll, spray, spring, splat, splash, street, strong, strike, square, squeeze

Time – 20 minutes

The teacher introduces the lesson by stating the lesson objectives which is to be able to identify three consonant onsets and pronounce them; and also make words correctly using three consonant onsets. The teacher asks the students some questions on the previous lesson e.g. what is a consonant cluster? Give examples of words with two consonant onsets and pronounce them. Teacher then tells the students to listen attentively to the 4 minutes 40 seconds recording being played on the record player while also looking at the orthographic representation being displayed.

Tape script

- Listen to the phonemes individually and then as a cluster for the list of words
- Make visible their orthographic representations while the sound file is being played e.g. s + c + r = scr as in scratch, s + p + l = spl as in splash
- Listen to the list of all the examples of words with three consonant onsets and imitate

Activity

Using the same method as the previous lesson, the teacher gives students activity on words with three consonat onsets.

Conclusion

Same method as the previous lesson.

Week two 09/02/2015 – 13/02/2015: Consonant codas

Lesson 3 – Two consonant codas: Ct, Cd, Cp, Ck (Consonant + /t/, /d/, /p/, /k/)

Word list: Hand, band, tent, plant, lamp, jump, vest, nest, mask, desk, ink, tank

Time – 20 minutes

The teacher introduces the lesson by stating the lesson objectives which is to be able to identify two consonant codas and pronounce them correctly; and also make words using two consonant codas. The teacher asks the students some questions on the previous lessons e.g. give examples of words with 2 and three consonant onsets and pronounce them. Teacher then tells the students to listen attentively to the 4 minutes 5 seconds recording being played on the record player while also looking at their orthographic representation being displayed.

Tape script

- Listen to the phonemes individually and then as a cluster for the list of words

- Make visible their orthographic representations while the sound file is being played e.g. n + d = nd as in hand, s + k= sk as in desk
- Listen to the list of the examples of words with two consonant codas and imitate

Activity

Using the same method as the previous lesson, the teacher gives students activity on words with two consonant codas.

Conclusion

Same method as the previous lessons.

Lesson 4 – Three consonant codas: /mpt/, /nts/, /mps/, /kst/

Word list: Exempt, tempt, ants, chants, glimpse, imps, thanks, banks, films, bulbs, text, boxed

Time – 20 minutes

The teacher introduces the lesson by stating the lesson objectives is to be able to identify three consonant clusters at the end of words and pronounce them correctly; and also make words using three consonant codas. The teacher asks the students some questions on the previous lessons e.g. give examples of words with two consonant codas and pronounce them. Teacher then tells the students to listen attentively to the five minutes 5 seconds recording being played on the record player while also looking at their orthographic representation being displayed.

Tape script

- Listen to the phonemes individually and then as a cluster for the list of words
- Make visible their orthographic representations while the sound file is being played e.g. m + p + t = mpt as in tempt, n + k +s = nks as in banks
- Listen to the list of all the example of words with three consonant codas and imitate

Activity

Using the same method as the previous lesson, the teacher gives students activity on words with three consonant codas.

Conclusion

Same method as the previous lessons.

Week three 16/02/2015 – 20/02/2015: Silent letters

Lesson 5 – initial silent letters: k_, w_, p_, g_, h_,

Word list: Knife, knit, wrestle, wrinkle, write, psychology, pneumonia, gnaw, gnash, honour, heir, hour

Time – 20 minutes

The teacher introduces the lesson by stating the lesson objectives which is to be able to define and identify silent letters and pronounce words with silent letters at the beginning of words correctly; also to give examples of words with initial silent letters. Teacher asks the students what they think a silent letter is and after a couple of minutes brainstorming, gives them the definition as follows: silent letters are consonants or vowels represented and spelt in certain words but are not pronounced. Teacher then tells the students to listen attentively to the 1 minute 30 seconds recording being played on the record player while also looking at their orthographic representation being displayed.

Tape script

- Listen to the silent letters individually and then to the entire word e.g. **k** knife, **p** psychology, **g** gnash, **h** hour
- Make visible their orthographic representations with the silent letters underlined while the sound file is being played e.g. **k**nife, **p**sychology, **g**nash, **h**our
- Listen to the list of example of words with initial silent letters and imitate

Activity

Using the same method as the previous lesson, the teacher gives students activity on words with initial silent letters.

Conclusion

Same method as the previous lessons.

Lesson 6 – middle and final silent letters: _t_, _g_, _h_, _b_, _b, _n

Word list: Castle, whistle, sign, foreign, whale, rhyme, debt, doubt, thumb, comb, hymn, column

Time – 20 minutes

The teacher introduces the lesson by stating the lesson objectives which is to be able to identify words with silent letters at the middle and coda positions of words and pronounce them; and to

also give examples of words with middle and final silent letters. Teacher asks the students questions from the previous lesson e.g. define silent letters and give example of words with initial silent letters. Teacher then tells the students to listen attentively to the 1 minute 30 seconds recording being played on the record player while also looking at their orthographic representation being displayed.

Tape script

- Listen to the sounds individually and then the entire word e.g. whistle, rhyme, comb, hymn
- Make visible their orthographic representations while the sound file is being played e.g. w**h**istle, r**h**yme, com**b,** hym**n**
- Listen to the list of example of words with middle and final silent letters and imitate

Activity

Using the same method as the previous lesson, the teacher gives students activity on words with middle and final silent letters.

Conclusion

Same method as the previous lessons.

Week four 23/02/2015 – 27/02/2015: Consonant digraphs

Lesson 7 – initial and final digraphs: /ch/, /ph/, /th/, /sh/, /ng/, /gh/,

Word list; Child, church, phone, physical, thick, that, ship, flush, ring, bang, enough, cough

Time – 20 minutes

The teacher introduces the lesson by stating the lesson objectives which is to be able to define consonant digraph, identify them in words and pronounce them correctly; also give example of words containing consonant digraphs. The teacher asks students what they think consonant digraph is and after a couple of minutes brainstorming, gives them the definition: consonant digraph is when two consonant letters come together to make one sound. Unlike consonant clusters that follow each other in a sequence and each consonant is pronounced as a separate sound, consonant digraphs combine to make one sound. Teacher then tells the students to listen attentively to the 4 minutes 5 seconds recording being played on the record player while also looking at their orthographic representation being displayed.

Tape script

- Listen to the sounds individually and then as a digraph e.g. c + h = ch as in child, g + h = gh as in cough
- Make visible their orthographic representations while the sound file is being played with the digraphs underlined e.g. c + h = ch as in **ch**ild, g + h = gh as in cou**gh**
- Listen to the list of example of words with initial and final digraphs and imitate and imitate

Activity

Using the same method as the previous lesson, the teacher gives students activity on words with initial and final digraphs

Conclusion

Same method as the previous lessons.

Lesson 8 – Clusters with digraphs: /ntʃ/, /ndʒ/, /mf/, /ksθ/, /lfθ/, /pθ/

Word list: Munch, branch, bench, orange, syringe, fringe, nymph, triumph, lymph, twelfth, sixth, depth

Time – 20 minutes

The teacher introduces the lesson by stating the lesson objectives which is to be able to identify words which end with clusters that contains a single consonant and a digraph together and to pronounce them correctly; also giving examples. The teacher asks the students questions on the previous lesson e.g. what a consonant digraph is and give examples. The teacher explains to the students that some words end with a consonant clusters that is a combination of a single consonant and a digraph. The teacher then tells the students to listen attentively to the 4 minute 10 seconds recording being played on the record player while also looking at their orthographic representation being displayed.

Tape script

- Listen to the sounds and digraphs individually and then as a cluster e.g. n + ch = nch as in bench, m + ph = mph as in triumph
- Make visible their orthographic representations while the sound file is being played e.g. n + ch = nch as in be**nch**, m + ph = mph as in triu**mph**

- Listen to the list of example of words with consonant clusters with digraphs and imitate

Activity

Using the same method as the previous lesson, the teacher gives students activity on words with consonant clusters consisting of a single consonant and a digraph.

Conclusion

Same method as the previous lessons.

Week five 02/03/2015 – 05/03/2015: Revision

Lesson 9 – Revision

Word list: Clay, plate, fridge, drum, drawer, snail, scratch, scroll, spray, splash, street, strong, square, squeeze, band, tent, lamp, vest, nest, desk, tank, exempt, tempt, ants, glimpse, thanks, instinct, films, text, boxed, knight, wrestle, wrinkle, psychology, pneumonia, gnaw, gnash, honour, heir, hour, castle, whistle, sign, whale, rhyme, debt, doubt, thumb, comb, hymn, column, church, physical, thick, teeth, flush, ring, cough, munch, bench, syringe, nymph, triumph, twelfth, sixth,

Time – 20 minutes

The teacher introduces the lesson by stating the lesson objectives which is to be able to revise all the lessons learnt on consonant clusters, silent letters and digraphs by identifying and pronouncing them correctly.

Tape script

- Listen to the list of words being played on the tape
- Repeat while seeing their written forms

Activity

Using the same method as the previous lesson, the teacher gives students activity on words containing consonant clusters, silent letters and digraphs

Conclusion

Same method as the previous lessons.

LIST Group

Week One 02/02/2015 - 06/02/2015: Consonant onsets

Lesson 1 – Two consonant onsets: Cl, Cr, Cn (Consonant + /l/, /r/, /n/)

Word list: Clay, block, flower, plate, plane, fridge, train, cross, drum, drawer, snap, snail

Time – 20 minutes

The teacher introduces the lesson same as lesson 1 of the listening + orthography group and then tells the students to listen attentively to the recording (same one played in the listening + orthography group) being played on the record player but no orthography.

Tape script

- Listen to the sounds individually and then as a cluster for the list of words e.g. c + l = cl as in clay, t + r = tr as in train
- Do not make visible their orthographic representations
- Listen to the list of examples of all the words with two consonant onsets and imitate

Activity

The teacher divides the students into smaller groups and using blank sheets of paper and pens, ask them to draw five things with two consonant onset in roughly three minutes after which one member of the group will present it to the rest of the class. The teacher then comments on student's group activity.

Conclusion

Teacher concludes the lesson by summarizing what was learnt and asks if there are any questions.

Lesson 2 – Three consonant onsets: sCC (/s/ + 2 other Consonants)

Word list: Scratch, scream, scroll, spray, spring, splat, splash, street, strong, strike, square, squeeze

Time – 20 minutes

The teacher introduces the lesson same as lesson 2 of the listening + orthography group and then tells the students to listen attentively to the recording (same one played in the listening + orthography group) being played on the record player but no orthography.

Tape script

- Listen to the phonemes individually and then as a cluster for the list of words e.g. s + c + r = scr as in scratch, s + p + l = spl as in splash
- Do not make visible their orthographic representations
- Listen to the list of all the examples of words with three consonant onsets and imitate

Activity

Using the same method as the previous lesson, the teacher gives students activity to draw five things with three consonat onsets.

Conclusion

Same method as the previous lesson.

Week two 09/02/2015 – 13/02/2015: Consonant codas

Lesson 3 – Two consonant codas: Ct, Cd, Cp, Ck (Consonant + /t/, /d/, /p/, /k/)

Word list: Hand, band, tent, plant, lamp, jump, vest, nest, mask, desk, ink, tank

Time – 20 minutes

The teacher introduces the lesson same as lesson 3 of the listening + orthography group and then tells the students to listen attentively to the recording (same one played in the listening + orthography group) being played on the record player but no orthography..

Tape script

- Listen to the phoneme individually and then as a cluster for the list of words e.g. n + d = nd as in hand, s + k= sk as in desk
- Do not make visible their orthographic representations
- Listen to the list of example of words with two consonant codas and imitate

Activity

Using the same method as the previous lesson, the teacher gives students activity to draw five things with two consonant codas.

Conclusion

Same method as the previous lessons.

Lesson 4 – Three consonant codas: /mpt/, /nts/, /mps/, /kst/

Word list: Exempt, tempt, ants, chants, glimpse, imps, thanks, banks, films, bulbs, text, boxed

Time – 20 minutes

The teacher introduces the lesson same as lesson 4 of the listening + orthography group and then tells the students to listen attentively to the recording (same one played in the listening + orthography group) being played on the record player but no orthography.

Tape script

- Listen to the phoneme individually and then as a cluster for the list of words e.g. m + p + t = mpt as in tempt, n + k +s = nks as in banks
- Do not make visible their orthographic representations
- Listen to the list of example of words with three consonant codas and imitate

Activity

Using the same method as the previous lesson, the teacher gives students activity to draw five things with 3 coda consonant clusters.

Evaluation

Same method as the previous lessons.

Week three 16/02/2015 – 20/02/2015: Silent letters

Lesson 5 – initial silent letters: k_, w_, p_, g_, h_,

Word list: Knife, knit, wrestle, wrinkle, write, psychology, pneumonia, gnaw, gnash, honour, heir, hour

Time – 20 minutes

The teacher introduces the lesson same as lesson 5 of the listening + orthography group and then tells the students to listen attentively to the recording (same one played in the listening + orthography group) being played on the record player but no orthography..

Tape script

- Listen to the silent letters individually and then to the entire word e.g. **k** knife, **p** psychology, **g** gnash, **h** hour
- Do not make visible their orthographic representations

- Listen to the list of example of words with initial silent letters and imitate

Activity

Using the same method as the previous lesson, the teacher gives students activity to draw five things with initial silent letters.

Conclusion

Same method as the previous lessons.

Lesson 6 – middle and final silent letters: _t_, _g_, _h_, _b_, _b, _n

Word list: Castle, whistle, sign, foreign, whale, rhyme, debt, doubt, thumb, comb, hymn, column

Time – 20 minutes

The teacher introduces the lesson same as lesson 6 of the listening + orthography group and then tells the students to listen attentively to the recording (same one played in the listening + orthography group) being played on the record player but no orthography.

Tape script

- Listen to the sounds individually and then to the entire word e.g. whistle, rhyme, comb, hymn
- Do not make visible their orthographic representations
- Listen to the list of example of words with middle and final silent letters and imitate

Activity

Using the same method as the previous lesson, the teacher gives students activity to draw five things with middle and final silent letters.

Conclusion

Same method as the previous lessons.

Week four 23/02/2015 – 27/02/2015: Consonant digraphs

Lesson 7 – initial and final digraphs: /ch/, /ph/, /th/, /sh/, /ng/, /gh/,

Word list: Child, church, phone, physical, thick, that, ship, flush, ring, bang, enough, cough

Time – 20 minutes

The teacher introduces the lesson same as lesson 7 of the listening + orthography group and then tells the students to listen attentively to the recording (same one played in the listening + orthography group) being played on the record player but no orthography..

Tape script

- Listen to the phonemes individually and then as a digraph e.g. c + h = **ch** as in child, g + h = **gh** as in cough
- Do not make visible their orthographic representations
- Listen to the list of example of words with initial and final digraphs and imitate

Activity

Using the same method as the previous lesson, the teacher gives students activity to draw five things with initial and final.

Conclusion

Same method as the previous lessons.

Lesson 8 – Consonant clusters with digraphs: /ntʃ/, /ndʒ/, /mf/, /ksθ/, /lfθ/, /pθ/

Word list: Munch, branch, bench, orange, syringe, fringe, nymph, triumph, lymph, twelfth, sixth, depth

Time – 20 minutes

The teacher introduces the lesson same as lesson 8 of the listening + orthography group and then tells the students to listen attentively to the recording (same one played in the listening + orthography group) being played on the record player but no orthography.

Tape script

- Listen to the sounds and digraphs individually and then as a cluster e.g. n + ch = nch as in bench, m + ph = mph as in triumph
- Do not make visible their orthographic representations
- Listen to the list of example of words with consonant clusters with digraphs and imitate

Activity

Using the same method as the previous lesson, the teacher gives students activity to draw five things with consonant clusters consisting of a single consonant and a digraph.

Conclusion

Same method as the previous lessons.

Week five 02/03/2015 – 05/03/2015: Revision

Lesson 9 – Revision

Word list: Clay, plate, fridge, drum, drawer, snail, scratch, scroll, spray, splash, street, strong, square, squeeze, band, tent, lamp, vest, nest, desk, tank, exempt, tempt, ants, glimpse, thanks, instinct, films, text, boxed, knight, wrestle, wrinkle, psychology, pneumonia, gnaw, gnash, honour, heir, hour, castle, whistle, sign, whale, rhyme, debt, doubt, thumb, comb, hymn, column, church, physical, thick, teeth, flush, ring, cough, munch, bench, syringe, nymph, triumph, twelfth, sixth,

Time – 20 minutes

Teacher introduces the lesson and ask student to sit down comfortably and listen to the recorded tape script

- Listen to the following list of words
- Repeat without seeing their written forms

Activity

Using the same method as the previous lesson, the teacher gives students activity to draw draw 20 things with containing consonant clusters, silent letters and digraphs.

Conclusion

Same method as the previous lessons.

TTM group

Week One 02/02/2015 - 06/02/2015: Consonant onsets

Lesson 1 – Two consonant onsets: Cl, Cr, Cn (Consonant + /l/, /r/, /n/)

Word list: Clay, block, flower, plate, plane, fridge, train, cross, drum, drawer, snap, snail

Lesson plan

Topic Consonant onsets

Lesson lesson 1 – two consonant onsets

Time 20 minutes

Materials chalkboard, chalk, blank sheets of paper, pens

Objectives At the end of the lesson the students should be able to identify two consonant clusters at the beginning of words and pronounce them; and also make words correctly using two consonant onsets.

Procedure

Step 1 The teacher ask students what they think a consonant cluster is and after a couple of minutes brainstorming, give them the definition as follows: consonant clusters are two or more consonants following each other in a sequence and can occupy the beginning, middle or coda position of a word.

Step 2 Teacher then writes several examples of words with two consonant onsets on the chalkboard and underline the clusters e.g. clay, block, flower, plate, plane, fridge, train, cross, drum, drawer, snap, snail

Step 3 Teacher pronounces the clusters and examples for the students to listen to how they are being pronounced.

Step 4 Teacher asks the students to imitate her as she pronounces each example.

Evaluation Teacher erases the board and divides the students into smaller groups. Using blank sheets of paper and pens, asks them to write down five words with two consonant onsets in roughly three minutes after which a representative from each group will come up to the front of the class and present their conclusions. The teacher then makes comments on the students group.

Conclusion Teacher concludes the lesson by summarizing what was learnt and ask if there are any questions.

Lesson 2 – Three consonant onsets: sCC (/s/ + 2 other Consonants)

Word list: Scratch, scream, scroll, spray, spring, splat, splash, street, strong, strike, square, squeeze

Lesson plan

Topic Consonant onsets

Lesson lesson 2 – three consonant onsets

Time 20 minutes

Materials chalkboard, chalk, blank sheets of paper, pens

Objectives At the end of the lesson the students should be able to identify 3 consonant clusters at the beginning of words and to be able to pronounce them; and also make words correctly using three consonant onsets.

Procedure

Step 1 The teacher begins the lesson by asking the students questions on the previous lesson e.g. what is a consonant cluster? Give examples of words with two consonant onsets and pronounce them.

Step 2 Teacher writes several examples of words with three consonant onsets on the chalkboard and underline the clusters e.g. scratch, scream, scroll, spray, spring, splat, splash, street, strong, strike, square, squeeze

Step 3 Teacher pronounces the clusters and examples for the students to listen to how they are being pronounced.

Step 4 Teacher asks the students to imitate her as she pronounces each example.

Evaluation Using the same method as the previous lesson, the teacher ask students to write down words with three consonant onsets.

Conclusion Same method as the previous lesson.

Week two 09/02/2015 – 13/02/2015: Consonant codas

Lesson 3 – Two consonant codas: Ct, Cd, Cp, Ck (Consonant + /t/, /d/, /p/, /k/)

Word list: Hand, band, tent, plant, lamp, jump, vest, nest, mask, desk, ink, tank

Lesson plan

Topic Consonant onsets

Lesson lesson 3 – two consonant codas

Time 20 minutes

Materials chalkboard, chalk, blank sheets of paper and pens

Objectives At the end of the lesson the students should be able to identify two consonant clusters at the end of words and pronounce them correctly; and also make words using two consonant codas

Procedure

Step 1 The teacher begins the lesson by asking the students questions on the previous lesson e.g. give examples of words with three consonant onsets and pronounce them.

Step 2 Teacher writes several examples of words with two consonant codas on the chalkboard and underline the clusters e.g. ha<u>nd</u>, ba<u>nd</u>, te<u>nt</u>, pla<u>nt</u>, la<u>mp</u>, ju<u>mp</u>, ve<u>st</u>, ne<u>st</u>, ma<u>sk</u>, de<u>sk</u>, i<u>nk</u>, ta<u>nk</u>

Step 3 Teacher pronounces the clusters and examples for the students to listen to how they are being pronounced.

Step 4 Teacher asks the students to imitate her as she pronounces each example.

Evaluation Teacher erases the board and divides the students into smaller groups. Using blank sheets of paper and pens, asks them to write down five words with two consonant codas in roughly three minutes after which a representative from each group will come up to the front of the class and present their conclusions. The teacher then makes comments on the students group work and corrects any errors made by the students.

Conclusion Same method as the previous lessons.

Lesson 4 – Three consonant codas: /mpt/, /nts/, /mps/, /kst/

Word list: Exempt, tempt, ants, chants, glimpse, imps, thanks, banks, films, bulbs, text, boxed

<u>Lesson plan</u>

Topic Consonant codas

Lesson lesson 4 – three consonant codas

Time 20 minutes

Materials chalkboard, chalk, blank sheets of paper and pens

Objectives At the end of the lesson the students should be able to identify three consonant clusters at the end of words and pronounce them correctly; and also make words using three consonant codas

Procedure

Step 1 The teacher begins the lesson by asking the students questions on the previous lesson e.g. give examples of words with two consonant codas and pronounce them.

Step 2 Teacher writes several examples of words with three consonant codas on the chalkboard and underline the clusters e.g. exempt, tempt, ants, chants, glimpse, imps, thanks, banks, films, bulbs, text, boxed

Step 3 Teacher pronounces the clusters and examples for the students to listen to how they are being pronounced.

Step 4 Teacher asks the students to imitate her as she pronounces each example.

Evaluation Using the same method as the previous lesson, the teacher ask students to write down words with three consonant codas.

Conclusion Same method as the previous lessons.

Week three 16/02/2015 – 20/02/2015: Silent letters

Lesson 5 – initial silent letters: k_, w_, p_, g_, h_,

Word list: Knife, knit, wrestle, wrinkle, write, psychology, pneumonia, gnaw, gnash, honour, heir, hour

Lesson plan

Topic Silent letters

Lesson lesson 5 – initial silent letters

Time 20 minutes

Materials chalkboard, chalk, blank sheets of paper and pens

Objectives At the end of the lesson the students should be able to define and identify silent letters and pronounce words with silent letters at the beginning of words correctly. Also give examples of words with initial silent letters.

Procedure

Step 1	The teacher asks students what they think silent letter is and after a couple of minutes brainstorming, give them the definition: silent letter is a consonant or vowel represented and spelt in certain words but not pronounced.
Step 2	Teacher writes several examples of words with initial silent letters on the chalkboard and underline the silent letters e.g. Knife, knit, wrestle, wrinkle, write, psychology, pneumonia, gnaw, gnash, honour, heir, hour,
Step 3	Teacher says the words for the students to listen to the way they are pronounced.
Step 4	Teacher asks the students to imitate her as she pronounces each example.
Evaluation	Using the same method as the previous lesson, the teacher ask students to write down words with initial silent letters and circle the silent letter.
Conclusion	Same method as the previous lessons.

Lesson 6 – middle and final silent letters: _t_, _g_, _h_, _b_, _b, _n

Word list: Castle, whistle, sign, foreign, whale, rhyme, debt, doubt, thumb, comb, hymn, column

Lesson plan

Topic	Silent letters
Lesson	lesson 6 – middle and final silent letters
Time	20 minutes
Materials	chalkboard, chalk, blank sheets of paper and pens
Objectives	At the end of the lesson the students should be able to locate silent letters and pronounce words with silent letters at the middle and end of words; and also give examples of words with middle and final silent letters.

Procedure

Step 1	The teacher begins the lesson by asking the students questions on the previous lesson e.g. define silent letters and give example of words with initial silent letters.

Step 2 Teacher writes several examples of words with middle and final silent letters on the chalkboard and underline the silent letters e.g. cas<u>t</u>le, whis<u>t</u>le, si<u>g</u>n, forei<u>g</u>n, w<u>h</u>ale, r<u>h</u>yme, de<u>b</u>t, dou<u>b</u>t, thum<u>b</u>, com<u>b</u>, hym<u>n</u>, colum<u>n</u>

Step 3 Teacher says the words for the students to listen to the way they are pronounced.

Step 4 Teacher asks the students to imitate her as she pronounces each example.

Evaluation Using the same method as the previous lesson, the teacher ask students to write down words with middle and final silent letters and circle the silent letters.

Conclusion Same method as the previous lessons.

Week four 23/02/2015 – 27/02/2015: Consonant digraphs

Lesson 7 – initial and final digraphs: /ch/, /ph/, /th/, /sh/, /ng/, /gh/,

Word list: Child, church, phone, physical, thick, that, ship, flush, ring, bang, enough, cough

<u>Lesson plan</u>

Topic Consonant digraphs

Lesson lesson 7 – initial and final digraphs

Time 20 minutes

Materials chalkboard, chalk, blank sheets of paper and pens

Objectives At the end of the lesson the students should be able to define consonant digraph, identify them in words and pronounce them correctly. Also give example of words containing consonant digraphs.

Procedure

Step 1 The teacher asks students what they think consonant digraph is and after a couple of minutes brainstorming, give them the definition: consonant digraph is when two consonant letters come together to make one sound. Unlike consonant clusters that follow each other in a sequence and each consonant is pronounced as a separate sound, digraphs combine to make one sound.

Step 2 Teacher writes several examples of words with consonant digraphs on the chalkboard and underline the letters combined in a digraph e.g. <u>ch</u>ild, <u>ch</u>urch, <u>ph</u>one, <u>ph</u>ysical, <u>th</u>ick, <u>th</u>at, <u>sh</u>ip, flu<u>sh</u>, ri<u>ng</u>, ba<u>ng</u>, enou<u>gh</u>, cou<u>gh</u>

Step 3 Teacher says the letters and pronounce the digraphs and examples for the students to listen to the way they are pronounced.

Step 4 Teacher asks the students to imitate her as she pronounces each example.

Evaluation Using the same method as the previous lesson, the teacher ask students to write down words with initial and final digraphs and circle the digraphs.

Conclusion Same method as the previous lessons.

Lesson 8 – Consonant clusters with digraphs: /ntʃ/, /ndʒ/, /mf/, /ksθ/, /lfθ/, /pθ/

Word list: Munch, branch, bench, orange, syringe, fringe, nymph, triumph, lymph, twelfth, sixth, depth

Lesson plan

Topic Consonant digraphs

Lesson lesson 8 – consonant clusters with digraphs

Time 20 minutes

Materials chalkboard, chalk, blank sheets of paper and pens

Objectives At the end of the lesson the students should be able to identify words which end with consonant clusters that contain a single consonant and a digraph together and to pronounce them correctly; also giving examples.

Procedure

Step 1 The teacher asks the students questions on the previous lesson e.g. what a consonant digraph is and give examples. Then the teacher tells the students that some words end with a consonant clusters that is a combination of a single consonant and a digraph.

Step 2 Teacher writes several examples of words with consonant clusters with digraphs on the chalkboard and underline the letters in the cluster e.g. munch, branch, bench, orange, syringe, fringe, nymph, triumph, lymph, twelfth, sixth, depth

Step 3 Teacher says the letters and digraphs then pronounce the clusters and examples for the students to listen to the way they are pronounced.

Step 4 Teacher asks the students to imitate her as she pronounces each example.

Evaluation Using the same method as the previous lesson, the teacher ask students to write down words with consonant clusters in codas which are combined with digraphs.

Conclusion Same method as the previous lessons.

Week five 02/03/2015 – 05/03/2015: Revision

Lesson plan

Topic Revision

Lesson Lesson 9 – Revision of consonant clusters, silent letters and digraphs.

Time 20 minutes

Materials chalkboard, chalk, blank sheets of paper and pens

Objectives At the end of the lesson the students should be able to pronounce and write correctly words with consonant clusters, silent letters and digraphs.

Procedure

Step 1 The teacher write the words on the chalk board and underline the cluster, silent letters and digraphs in initial, middle and final positions.

Step 2 Teacher says the words one after the other and asks students to repeat after her e.g. Clay, plate, fridge, drum, drawer, snail, scratch, scroll, spray, splash, street, strong, square, squeeze, band, tent, lamp, vest, nest, desk, tank, exempt, tempt, ants, glimpse, thanks, instinct, films, text, boxed, knight, wrestle, wrinkle, psychology, pneumonia, gnaw, gnash, honour, heir, hour, castle, whistle, sign, whale, rhyme, debt, doubt, thumb, comb, hymn, column, church, physical, thick, teeth, flush, ring, cough, munch, bench, syringe, nymph, triumph, twelfth, sixth,

Evaluation Using the same method as the previous lesson, the teacher ask students to write down words with consonant clusters, silent letters and digraphs.

Conclusion Same method as the previous lessons.

Appendix E: Spot-check marks

Appendix E.1: Pre-test spot-check marks

Participant code:4	Marker 1 (T)		Marker 2 (R)		Marker 3 (A)	
Pre-test Tokens	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**
Two-consonant onsets	5	5	5	5	5	5
Three-consonant onsets	0	0	0	0	0	0
Two-consonant codas	1	4	2	4	3	3
Three-consonant codas	3	4	3	4	3	3
Initial silent letters	1	0	1	0	1	0
Mid/final silent letters	3	1	3	0	2	1
Initial digraphs	3	4	3	4	2	4
Final digraphs	3	3	3	2	3	2
Clusters with digraphs	3	3	3	3	3	3
Total	22/40	24/40	22/40	22/40	22/40	21/40

Participant code:9	Marker 1 (T)		Marker 2 (R)		Marker 3 (A)	
Pre-test Tokens	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**
Two-consonant onsets	5	5	5	5	4	5
Three-consonant onsets	1	1	1	2	1	2
Two-consonant codas	1	4	1	3	2	3
Three-consonant codas	3	4	3	4	3	4
Initial silent letters	1	1	1	1	1	1
Mid/final silent letters	3	2	3	4	3	3
Initial digraphs	3	3	3	3	3	4
Final digraphs	3	2	2	1	2	2
Clusters with digraphs	3	3	3	4	3	4
Total	23/40	26/40	22/40	27/40	22/40	28/40

Participant code:10	Marker 1 (T)		Marker 2 (R)		Marker 3 (A)	
Pre-test Tokens	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**	**Picture-naming**	Reading
Two-consonant onsets	4	3	4	3	4	2
Three-consonant onsets	1	0	1	0	1	0
Two-consonant codas	1	2	2	3	2	2
Three-consonant codas	1	1	1	1	0	0
Initial silent letters	1	0	1	0	1	0
Mid/final silent letters	2	2	1	2	2	2
Initial digraphs	3	1	3	1	3	2
Final digraphs	1	1	1	0	1	1
Clusters with digraphs	2	1	2	1	2	1
Total	16/40	11/40	16/40	11/40	16/40	10/40

Participant code:13	Marker 1 (T)		Marker 2 (R)		Marker 3 (A)	
Pre-test Tokens	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**
Two-consonant onsets	5	5	5	5	5	5
Three-consonant onsets	2	5	2	4	2	5
Two-consonant codas	2	4	2	5	2	4
Three-consonant codas	1	3	1	4	1	4
Initial silent letters	1	3	1	4	1	4
Mid/final silent letters	2	2	2	4	2	2
Initial digraphs	3	3	4	3	3	4
Final digraphs	3	3	3	3	3	3
Clusters with digraphs	3	4	3	4	3	5
Total	22/40	34/40	23/40	36/40	22/40	36/40

Participant code:34	Marker 1 (T)		Marker 2 (R)		Marker 3 (A)	
Pre-test Tokens	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**
Two-consonant onsets	5	5	5	5	5	5
Three-consonant onsets	5	5	5	5	5	5
Two-consonant codas	1	4	1	4	2	4
Three-consonant codas	2	4	2	4	3	4
Initial silent letters	1	1	1	1	1	1
Mid/final silent letters	3	3	4	3	3	3
Initial digraphs	3	3	3	4	3	4
Final digraphs	3	3	3	2	3	4
Clusters with digraphs	2	3	2	4	2	3
Total	25/40	31/40	26/40	32/40	27/40	33/40

Participant code:36	Marker 1 (T)		Marker 2 (R)		Marker 3 (A)	
Pre-test Tokens	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**
Two-consonant onsets	4	5	4	5	4	5
Three-consonant onsets	1	1	1	2	1	1
Two-consonant codas	1	2	2	2	1	2
Three-consonant codas	1	1	1	1	0	0
Initial silent letters	1	0	1	0	1	0
Mid/final silent letters	2	0	2	0	2	0
Initial digraphs	1	3	1	3	1	3
Final digraphs	2	2	2	1	2	2
Clusters with digraphs	1	4	1	4	1	4
Total	14/40	18/40	15/40	18/40	13/40	17/40

Participant code:38	Marker 1 (T)		Marker 2 (R)		Marker 3 (A)	
Pre-test Tokens	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**
Two-consonant onsets	5	5	5	5	5	5
Three-consonant onsets	0	5	0	5	0	5
Two-consonant codas	3	4	3	4	3	4
Three-consonant codas	1	4	1	4	1	4
Initial silent letters	1	2	1	2	1	1
Mid/final silent letters	3	3	3	3	3	3
Initial digraphs	2	3	3	3	3	4
Final digraphs	2	4	2	2	2	3
Clusters with digraphs	2	4	2	3	2	3
Total	19/40	32/40	20/40	32/40	20/40	32/40

Participant code:49	Marker 1 (T)		Marker 2 (R)		Marker 3 (A)	
Pre-test Tokens	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**
Two-consonant onsets	3	4	4	5	3	4
Three-consonant onsets	0	2	0	2	0	2
Two-consonant codas	1	2	1	3	1	3
Three-consonant codas	1	4	1	4	1	4
Initial silent letters	0	1	0	1	0	1
Mid/final silent letters	1	1	2	1	1	2
Initial digraphs	2	3	3	4	2	3
Final digraphs	0	2	0	2	0	2
Clusters with digraphs	1	2	2	2	1	1
Total	9/40	21/40	10/40	22/40	9/40	22/40

Participant code:69	Marker 1 (T)		Marker 2 (R)		Marker 3 (A)	
Pre-test Tokens	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**
Two-consonant onsets	4	5	4	5	4	5
Three-consonant onsets	0	5	0	3	0	4
Two-consonant codas	1	4	1	4	1	4
Three-consonant codas	0	4	0	4	0	4
Initial silent letters	1	0	1	0	1	0
Mid/final silent letters	3	2	3	2	3	2
Initial digraphs	3	3	3	4	3	4
Final digraphs	2	2	2	0	2	2
Clusters with digraphs	0	1	0	3	0	3
Total	14/40	26/40	14/40	25/40	14/40	28/40

Participant code:73	Marker 1 (T)		Marker 2 (R)		Marker 3 (A)	
Pre-test Tokens	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**
Two-consonant onsets	4	5	4	5	4	5
Three-consonant onsets	1	3	0	3	0	3
Two-consonant codas	1	4	1	5	1	4
Three-consonant codas	1	1	1	1	1	1
Initial silent letters	1	1	1	1	1	0
Mid/final silent letters	0	2	1	2	1	1
Initial digraphs	3	4	4	4	4	4
Final digraphs	2	3	2	2	2	2
Clusters with digraphs	1	3	1	3	1	3
Total	15/40	26/40	15/40	26/40	15/40	23/40

Appendix E.2: Post-test spot-check marks

Participant code:6	Marker 1 (T)		Marker 2 (R)		Marker 3 (A)	
Post-test Tokens	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**
Two-consonant onsets	5	4	5	5	5	3
Three-consonant onsets	1	1	1	1	1	1
Two-consonant codas	1	0	1	0	2	1
Three-consonant codas	1	0	1	0	0	0
Initial silent letters	1	0	1	0	1	0
Mid/final silent letters	3	1	3	1	2	1
Initial digraphs	2	0	2	0	2	0
Final digraphs	2	2	2	2	2	2
Clusters with digraphs	3	1	3	1	2	1
Total	19/40	9/40	19/40	10/40	17/40	9/40

Participant code:8	Marker 1 (T)		Marker 2 (R)		Marker 3 (A)	
Post-test Tokens	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**
Two-consonant onsets	2	2	4	3	2	3
Three-consonant onsets	1	1	1	1	0	1
Two-consonant codas	1	2	1	2	1	2
Three-consonant codas	1	0	0	0	0	0
Initial silent letters	1	0	1	0	1	0
Mid/final silent letters	3	0	3	0	3	0
Initial digraphs	3	0	3	0	2	0
Final digraphs	0	0	0	0	1	0
Clusters with digraphs	2	2	3	1	3	1
Total	17/40	7/40	18/40	7/40	13/40	7/40

Participant code:13	Marker 1 (T)		Marker 2 (R)		Marker 3 (A)	
Post-test Tokens	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**
Two-consonant onsets	5	5	5	5	5	5
Three-consonant onsets	3	5	3	5	3	5
Two-consonant codas	4	4	4	4	4	4
Three-consonant codas	1	3	1	4	1	4
Initial silent letters	2	3	1	3	1	3
Mid/final silent letters	3	3	3	2	3	3
Initial digraphs	3	3	3	3	4	4
Final digraphs	3	4	2	3	2	4
Clusters with digraphs	4	5	4	5	4	4
Total	28/40	36/40	26/40	34/40	27/40	36/40

Participant code:26	Marker 1 (T)		Marker 2 (R)		Marker 3 (A)	
Post-test Tokens	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**
Two-consonant onsets	5	3	5	3	5	3
Three-consonant onsets	2	0	2	0	2	0
Two-consonant codas	1	0	1	0	1	0
Three-consonant codas	2	0	2	0	2	0
Initial silent letters	2	1	2	1	2	1
Mid/final silent letters	2	1	2	0	1	1
Initial digraphs	3	1	4	1	4	1
Final digraphs	3	1	1	1	2	1
Clusters with digraphs	3	0	3	0	3	0
Total	23/40	7/40	22/40	6/40	22/40	7/40

Participant code:31	Marker 1 (T)		Marker 2 (R)		Marker 3 (A)	
Post-test Tokens	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**
Two-consonant onsets	5	5	5	5	5	5
Three-consonant onsets	2	4	2	5	2	3
Two-consonant codas	4	4	3	3	4	4
Three-consonant codas	3	3	2	4	2	4
Initial silent letters	3	3	3	3	3	4
Mid/final silent letters	3	3	3	3	3	3
Initial digraphs	4	3	4	3	4	4
Final digraphs	2	3	2	2	3	3
Clusters with digraphs	4	4	4	4	4	4
Total	29/40	33/40	28/40	32/40	30/40	34/40

Participant code:43	Marker 1 (T)		Marker 2 (R)		Marker 3 (A)	
Post-test Tokens	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**
Two-consonant onsets	5	4	5	4	5	4
Three-consonant onsets	2	1	3	1	1	1
Two-consonant codas	2	3	2	3	1	3
Three-consonant codas	1	1	1	0	0	1
Initial silent letters	2	1	2	1	2	1
Mid/final silent letters	4	2	4	2	4	2
Initial digraphs	4	1	4	1	4	1
Final digraphs	3	1	2	1	2	1
Clusters with digraphs	4	1	2	1	3	1
Total	26/40	15/40	25/40	14/40	22/40	15/40

Participant code:49	Marker 1 (T)		Marker 2 (R)		Marker 3 (A)	
Post-test Tokens	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**
Two-consonant onsets	3	4	4	5	3	5
Three-consonant onsets	0	2	0	2	0	2
Two-consonant codas	1	3	1	3	1	3
Three-consonant codas	1	4	1	4	1	4
Initial silent letters	1	1	1	1	1	1
Mid/final silent letters	3	1	3	0	3	1
Initial digraphs	2	4	3	4	3	3
Final digraphs	0	3	0	2	0	3
Clusters with digraphs	2	4	2	4	3	4
Total	13/40	26/40	15/40	25/40	15/40	26/40

Participant code:51	Marker 1 (T)		Marker 2 (R)		Marker 3 (A)	
Post-test Tokens	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**
Two-consonant onsets	5	5	5	5	5	5
Three-consonant onsets	1	4	2	4	2	4
Two-consonant codas	2	5	2	5	2	5
Three-consonant codas	3	4	3	4	3	4
Initial silent letters	2	3	2	3	2	3
Mid/final silent letters	3	3	4	4	3	3
Initial digraphs	2	4	3	4	3	4
Final digraphs	2	3	2	3	2	3
Clusters with digraphs	4	4	3	4	4	4
Total	25/40	35/40	26/40	36/40	26/40	35/40

Participant code:61	Marker 1 (T)		Marker 2 (R)		Marker 3 (A)	
Post-test Tokens	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**
Two-consonant onsets	5	5	5	5	5	5
Three-consonant onsets	3	5	3	5	3	5
Two-consonant codas	2	5	1	5	2	5
Three-consonant codas	2	4	3	4	2	4
Initial silent letters	3	3	2	2	2	3
Mid/final silent letters	3	3	3	3	3	3
Initial digraphs	2	3	2	3	2	4
Final digraphs	2	3	2	2	2	3
Clusters with digraphs	3	3	3	3	3	3
Total	25/40	34/40	24/40	32/40	24/40	35/40

Participant code:73	Marker 1 (T)		Marker 2 (R)		Marker 3 (A)	
Post-test Tokens	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**	**Picture-naming**	**Reading**
Two-consonant onsets	4	5	4	5	5	5
Three-consonant onsets	2	4	2	5	3	5
Two-consonant codas	2	4	2	4	2	4
Three-consonant codas	2	1	2	1	2	1
Initial silent letters	1	3	1	3	1	3
Mid/final silent letters	3	2	4	2	3	2
Initial digraphs	3	3	4	4	4	4
Final digraphs	3	4	2	2	2	2
Clusters with digraphs	2	4	2	4	1	4
Total	22/40	30/40	23/40	30/40	23/40	30/40

Appendix F: Description of phonological features

(Adapted from Davenport and Hannahs 2010)

Syllabic

[+syll]: sounds that can function as the nucleus of the syllable (vowels, liquids and nasals).

[-syll]: sounds which do not function as the nucleus of the syllable (stops, fricatives, affricates and glides)

Sonorant

[+son]: sounds that show a clear formant pattern (vowels, nasals, glides and liquids)

[-son]: sounds that do not show a clear formant pattern (oral stops, fricatives and affricates)

Voice

[+voi]: sounds produced when the vocal cords are closed together so that it vibrates

[-voi]: sounds produced when the vocal cords are apart and no vibration in the vocal cords

Coronal

[+cor]: sounds that are produced involving the tip or blade of the tongue (dentals, alveolars, and palatals).

[-cor]: sounds that do not involve articulation using the tip or blade of the tongue (labials, velars, glottals)

Continuant

[+cont]: sounds that are produced with free air flow through the oral cavity (all other sounds except oral and nasal stops)

[-cont]: sounds that are produced with the stoppage of air flow in the oral cavity (oral and nasal stops)

Nasal

[+nas]: sounds produced when the velum is lowered and air flows through the nasal cavity (nasals [m, n, ŋ])

[-nas]: sounds that are produced without the flow of air through the nasal cavity (all other sounds except nasals)

Strident

[+stri]: sounds that are produced with some form of turbulence resulting in a noisy of hissing flow of the air (fricatives)

[-srti]: sounds produces with no constriction of air flow (all other sounds except fricatives)

Sibilant

[+sib]: sounds that are produced with a hissing effect when the air is directed through a narrow path with the tongue tip or blade towards the sharp edge of the teeth (fricatives (except labial fricatives [f and v], and affricates)

[-sib]: sounds that are produced with no hissing effect when the air is directed through a narrow path with the tongue tip or blade towards the sharp edge of the teeth (all other sounds including labial fricatives except sibilant fricatives and affricates [s, z, ʃ, ʒ, ʧ, ʤ])

Palatal

[+pal]: sounds produced with the front of the tongue raised against the hard palate (post-alveolars and palatals)

[-pal]: sounds that are produced without the front of the tongue against the hard palate (all other sounds except post-alveolars and palatals)

High

[+high]: sounds that are produce with the body of the tongue raised

[-high]: sounds that are produced without the body of the tongues being raised

Back

[+back]: sounds produced with the body tongue retracted

[-back]: sounds that are produced with no retraction of the body of the tongue

Front

[+front]: sounds that are produced with the body of the tongue at the front of the mouth

[-front]: sounds that are produced with the body of the tongue is not at the front of the mouth

Round

[+round]: sounds which are produced with protruding of the lips in a rounding manner

[-round]: sounds that are produced with the spread if the lips

Appendix G: Categories of perception and production tests errors

Appendix G.1: Perception (dictation task) errors

		Experimental Condition Groups		
Error categories		LIST+ORTH	LIST	TTM
Vowel epenthesis	Onset/initial	<store>, <stow>, <storo>, <stor>, <bulok>, <sinek>, <sinak>, <sinek>, <stobre>, <speech>, <culok>, <colok>, <colock>, <culo>, <culk>, <spiring>, <stobre>,	<sture>, <stor>, <sto>, <store>, <senk>, <sinik>, <sinak>, <colk>, <seebring>, <stoby>, <dorom>, <colo>, <bulo>, <colak, <sring>, <storboy>, <storovery>, <spering>, <spiring>, <sepren>, <speric>,	<colok>, <colock>, <colac>, <colo>, <colk>, <colck>, <bolk>, <durum>, <dorom>, <sanke>, <senak>, <senik>, <senk>, <sini>, <senek>, <senec>, <sinik>, <stor>, <storock>, <setro>, <spering>, <strore>,
	Mid			<westile>
	Coda/final	<anit>, <fensi>,<sirengi>, <benchi>,	<tanki>, <bence>	<fensi>, <benci>, <orangie>, <sirengi>
Deletion	Onset/initial	<stawbery>, <wiswotc>, <west wortch>,	<cock>, <criwdriver>, <traw>,	<cock>, <trow>, <stobri>, <trowbry>,
	Mid	<witle>,<sinbord>,	<wistworch>, <wiswoch>, <sinbord>,	<whsile>, <wistwat>, <wishwacht>, <wistowuch>,
	Coda/final	<hans>, <hand>, <ant>,<lams>, <laps>, <frige>, <bech>, <benc>, <brach>, <branc>, <benc>, <orage>, <orang>, <sring>, <syrige>, <siring>, <serige>, <sirige>	<des>, <ant>, <ans>, <hand>, <hans>, <laps>, <lam>, <com>, <orege>, <orang>, <oring>, <orage>, <bech>, <brach>, <friege>, <soring>, <frig>, <frige>,	<hans>, <hand>, <heans>, <ant>, <lams>, <laps>, <leam>, <fes>, <fen>, <lamp>, <doc>, <bech>, <orage>, <orong>, <oring>, <orang>, <orrage>, <oreng>, <frige> <sring>, <sering>,
	Onset/initial	<crock>,	<crock>,	
	Mid			

		Experimental Condition Groups		
Error categories		LIST+ORTH	LIST	TTM
Substitution	Coda/final	<desc>, <inc>, <fent>, <fens>, <fect>, <tanc>, <harns>, <hant>, <dog>, <frish>, <frich>, <friegh>, <frech>, <bensh>, <teet>, <tit>, <tif>, <sirinch>, <sirinch>,	<ands>, <fent>, <fenk>, <fench>, <hant>, <harns>, <teet>, <teech>, <teaf>, <tif>, <tis>, <dog>, <freach>, <fresh>, <ferish>, <come>, <frich>, <freange>, <bensh>, <bange>, <bransh>, <orench>, <oreash>, <sirinch>, <syrench>, <serigh>,	<dest>, <inc>, <ing>, <fent>, <fend>, <fench>, <come>, <anks>, <hance>, <lames>, <lambs>, <teet>, <teef>, <teif>, <teep>, <teed>, <dog>, <frech>, <friech>, <fringe>, <fraige>, <freash>, <frich>, <frinch>, <benge>, <bensh>, <brange>, <orench>, <sirinch>, <syrench>,
Metathesis	Onset/initial			<sanke>
	Mid	<singboth>	<signbord>,	<singboard>,
	Coda/final	<deks>,	<dexk>, <deaks>,	<deks>, <oragen>, <hans*d*>
Orthographic induced spelling	Initial	<nife>, <neaf>, <niten>, <niting>, <neeting>, <nimoniya>, <nimonia>, <nemoniear>, <knimonia>, <ristworch>, <willbero>, <willbarrow>, <welbiro>, <wilbyro>, <found>, <fong>,	<nife>, <naif>, <nief>, <nafi>, <nifi>, <nitin>, <neaten>, <nintin>, <nettle>, <niti>, <meeting>, <mitin>, <nimonea>, <nymoniya>, <nimoya>, <nimonia>, <ristworch>, <richwatch>, <wilbaror>, <willbaro>, <wilebarrow>, <willbiro>, <wilbyro>, <walebayro>, <wellbrow>, <syinbod>, <forn>, <foll>, <faind>,	<klock>, <nife>, <nifi>, <naf>, <nitin>, <nitten>, <nitting>, <neting>, <nithing>, <nitinc>, <niten>, <miting>, <nimoniyer>, <nimonea>, <nemoniya>, <nimoniya>, <nimonia>, <resworch>, <welbiro>, <wilbrow>, <wellbarrow>, <wilbairo>, <fun>, fon>, <foun>,
	Mid	<sinebord>, <sienboth>, <synbot>, <wissile>, <wisor>, <wishill>,	<wisle>, <wisile>, <wisill>, <wishil>, <wesul>, <wiso>, <weshu>,	<wisil>, <wesow>, <wesio>, <sainbort>, <sinbot>, <senbowte>, <synbord>, <sinboard>, <senbox>,
	Final	<desck>, <fens>,	<desck>, <desc>, <fens>,<dok>,	<fens>, <fins>,<desck>,

	Experimental Condition Groups		
Error categories	LIST+ORTH	LIST	TTM
Vernacular transfer spelling	<schudraver>, <schooldraiver>, <skoldriver>	<school driver>, <scoolbarva> <scondriver>	<schooldriver>, <secooldrava>, <school deriver>, <scholdraiba>
Loan word induced transfer spelling	<benci>, <bence>, <sirengi>	<bence>, <tanki>	<churche>, benci>, <seringi>

Appendix G.2: Production (picture-naming and reading) test errors by group

		Experimental Condition Groups		
Error categories		LIST+ORTH	LIST	TTM
Vowel epenthesis	Onest/initial	[k**u**lok, b**u**lok, d**u**rom, s**ɪ**nek, sp**ɪ**rɪŋ, sk**u**rdraɪvə]	[k**u**lok, k**o**lok, b**u**lok, b**u**roʃ, d**u**rom, sp**i**rin, s**ɪ**nek]	[b**u**lok, k**u**lok, s**ɪ**nek, s**a**nik, d**u**rom, d**u**ro, sp**ɪ**rɪŋ, s**ɪ**p**ɪ**rɪŋ]
	Mid			
	Coda/final	[sɪrɪŋʤ**ɪ**]	[sɪrɪŋʤ**ɪ**, benʧ**i**]	[benʧ**i**]
Consonant/digraph cluster reduction	Onset/initial	[wɪstwɒʧ]	[sroː, staberi, wɪstwɒʧ]	[stoː, stobrı, skudrɪvə, wɪstwɒʧ]
	Mid			
	Coda/final	[fen, hænd, hæns, læps, læm, læmp, ben, sɪrɪn,]	[fen, in, tan, hænd, hæns, læps, læp, læm, læmp, plɑːnt, sɪrɪn, beʧ, brɑːʧ, oreʧ]	[ant, fen, hænd, hæn, hæns, læmp, plɑːnt, ben, ɔːrɪdʒ]
Phone substitution	Onset/initial	[pon, hon]	[pon, hon]	[pon, hon]
	Mid			
	Coda/final	[fenʧ, teet, frɪʧ, ɔːrɪnʧ, sɪrnʧ]	[fenʧ, teet, rɪn, rɪnk, frɪʧ, frɪʃ, frɪŋ, orenʧ, sɪrɪnʧ]	[teet, rɪn, bens, frɪʧ, frɪʃ, orenʧ, sɪrɪnʧ]
Metathesis	Onset/initial			
	Mid		[sɪŋbɔːd]	
	Coda/final	[deks]	[deks]	[deks]
Orthographic production	Onset/initial	[penɪmonɪja, kɪtɪŋ, kɪnɪtɪŋ]	[penɪmonɪja, pemonɪja, pajamonɪja, kɪtɪŋ, kɪnɪtɪŋ]	[penɪmonɪja, kɪnɪtɪŋ, kɪnaɪf]
	Mid	[wɪstɪl, siginbɔːd]	[wɪstɪl, wɪʃtɪl wɪsɪr]	[wɪstɪl]
	Coda/final		[rɪŋg, kumb]	[Komb]
Vernacular transfer production			[benʧɪ, sɪrɪndʒɪ]	
Loan word induced transfer productions		[skuldraɪvə]	[skuldraɪvə, skuldɪreba, ɪnʤekʃən]	[skuldraɪvə, ɪnʤekʃən]

Appendix H: Feature specifications table for consonants and vowels

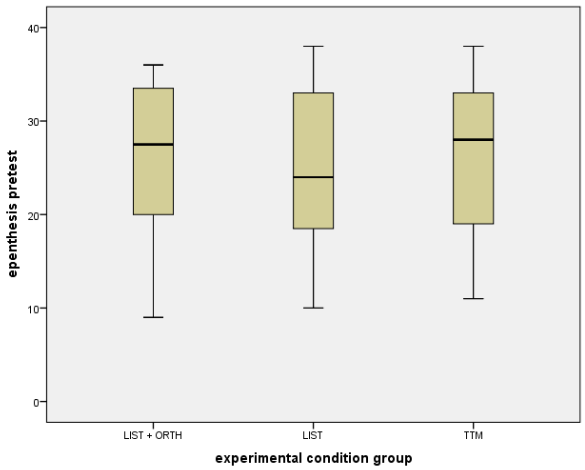
(Taken from Davenport and Hannahs 2010)

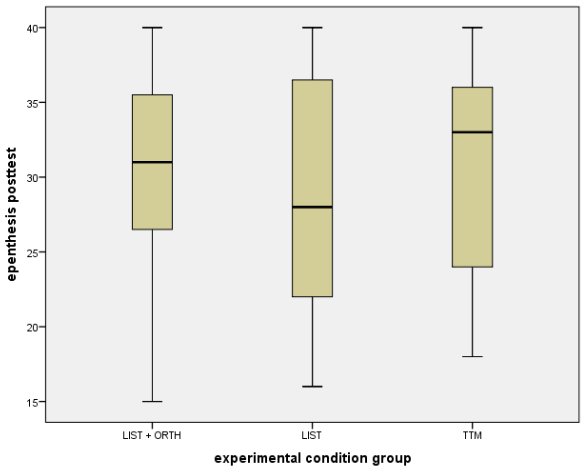
	p	b	t	d	ɾ	k	g	ʔ	ʧ	ʤ	f	v	θ	ð	s	z	ʃ	ʒ	x	h	m	n	ŋ	ɹ	l	w	j
syll	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+/-	+/-	+/-	+/-	+/-	-	-
cons	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-
son	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+
cor	-	-	+	+	+	-	-	-	+	+	-	-	+	+	+	+	+	+	-	-	-	+	-	+	+	-	+
ant	+	+	+	+	+	-	-	-	-	-	+	+	+	+	+	+	-	-	-	-	+	+	-	+	+	-	-
cont	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	-	-	-	+	+	+	+
nas	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-
stri	-	-	-	-	-	-	-	-	+	+	+	+	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-
lat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
del rel	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
hign	-	-	-	-	-	+	+	-	+	+	-	-	-	-	-	-	+	+	+	-	-	-	+	-	-	+	+
low	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
back	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
round	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
voice	-	+	-	+	+	-	+	-	-	+	-	+	-	+	-	+	-	+	-	-	+	+	+	+	+	+	+
	Stops								Affricates		Fricatives										Nasals			Liquids		Glides	
	Obstruents																				Sonorants						

	iː	ɪ	uː	ʊ	ɔ	oː	ɒ	ɑː	ʌ	æ	eː	ɛ	ə	ɜː
high	+	+	+	+	-	-	-	-	-	-	-	-	-	-
low	-	-	-	-	-	-	+	+	+	+	-	-	-	-
back	-	-	+	+	+	+	+	+	-	-	-	-	-	-
front	+	+	-	-	-	-	-	-	-	+	+	+	-	-
round	-	-	+	+	+	+	-	-	-	-	-	-	-	-
tense	+	-	+	-	-	+	-	+	-	-	+	-	-	+

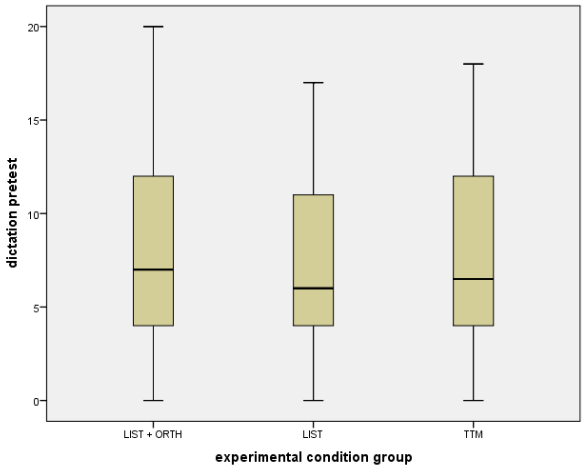
Appendix I:Box plots of experimental condition groups by effect of instruction

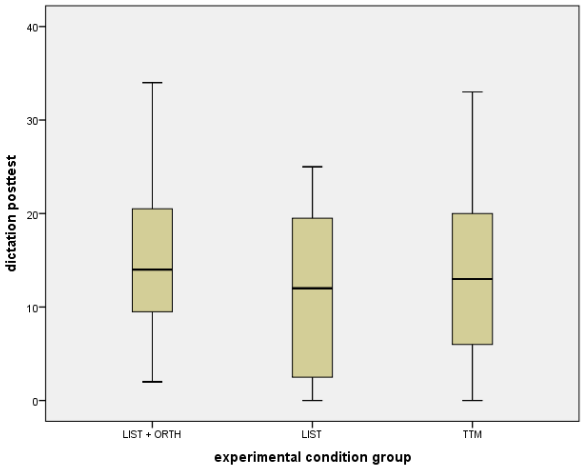
Appendix I.1: Epenthesis task pre-test and post-test



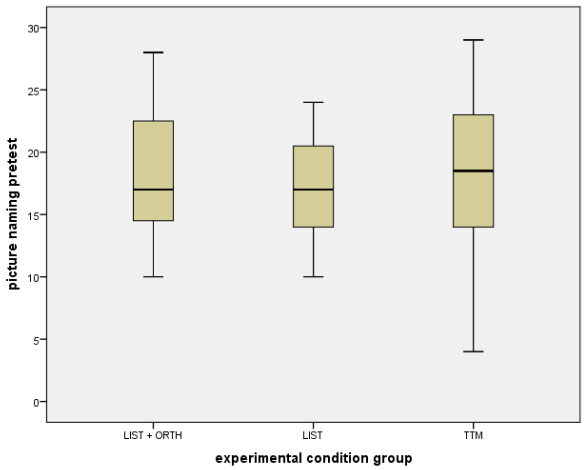


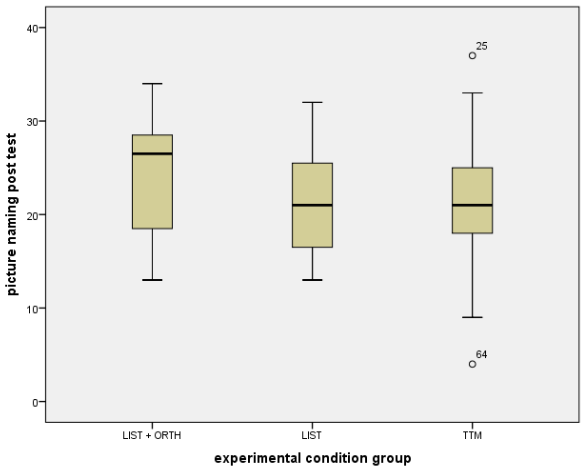
Appendix I.2: Dictation task pre-test and post-test



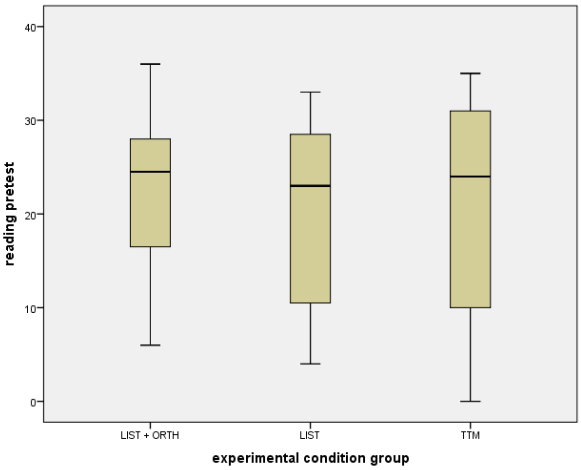


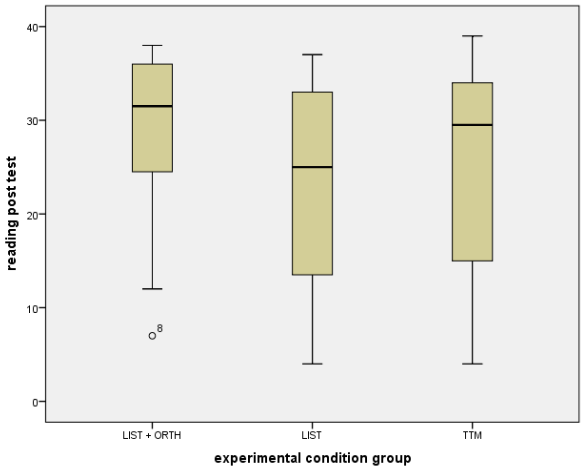
Appendix I.3: Picture-naming task pre-test and post-test





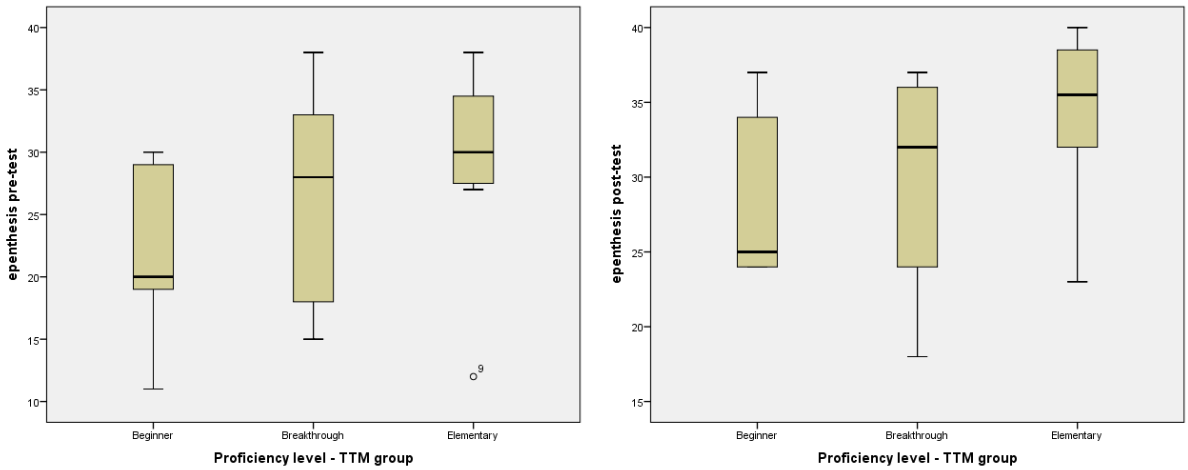
Appendix I.4: Reading task pre-test and post-test



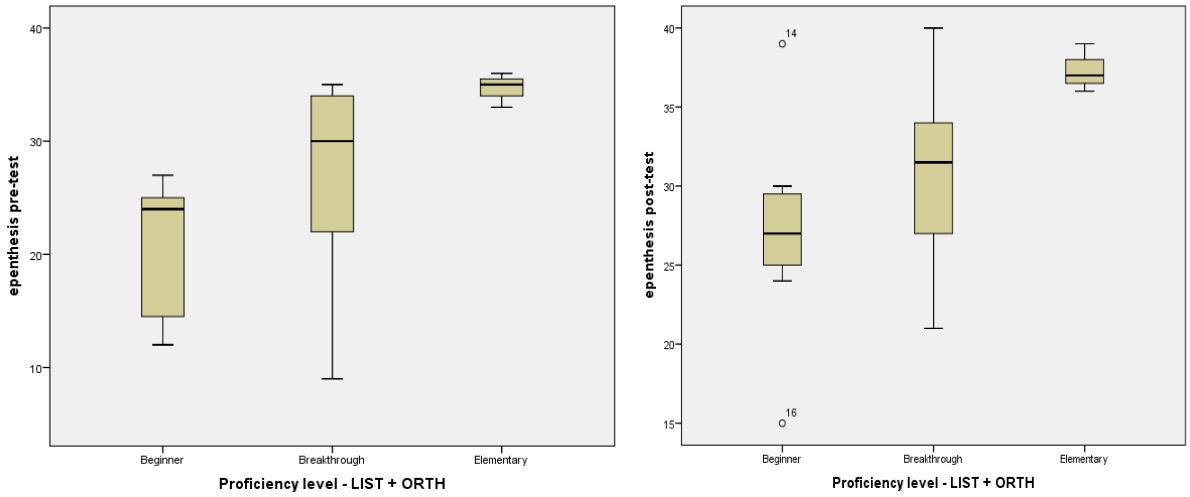


Appendix J: Box plots of experimental condition groups by proficiency level

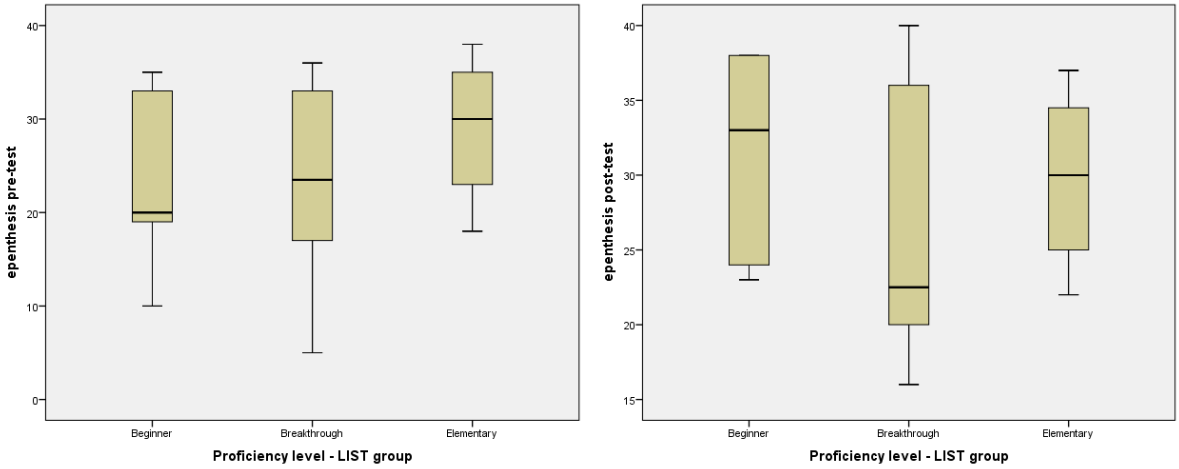
Appendix J.1: TTM group epenthesis task pre-test and post-test



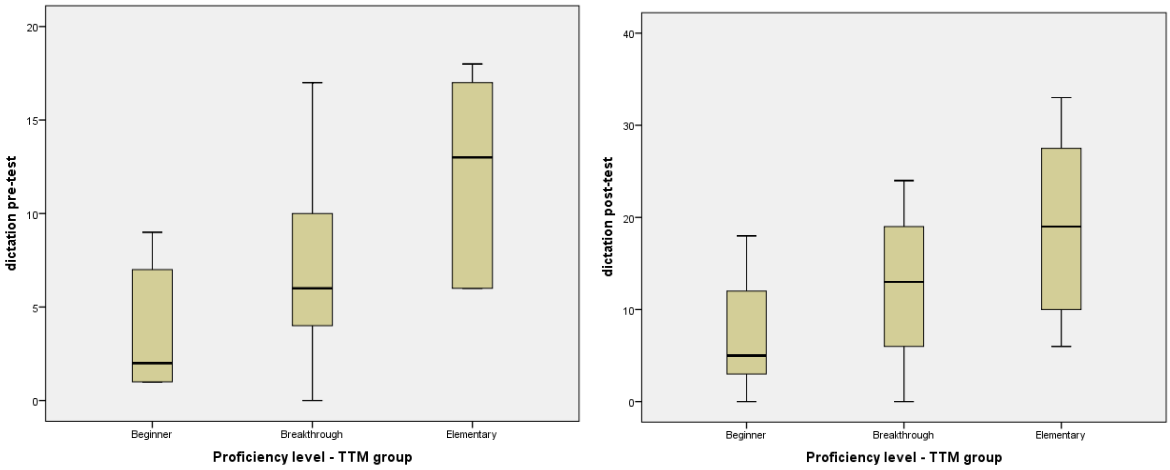
Appendix J.2: LIST + ORTH group epenthesis task pre-test and post-test



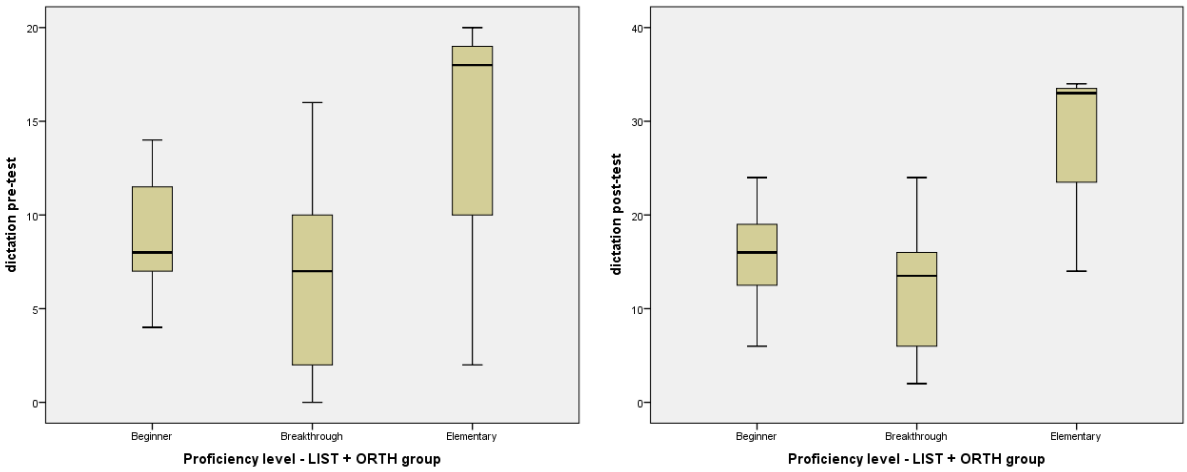
Appendix J.3: LIST group pre-test and post-test



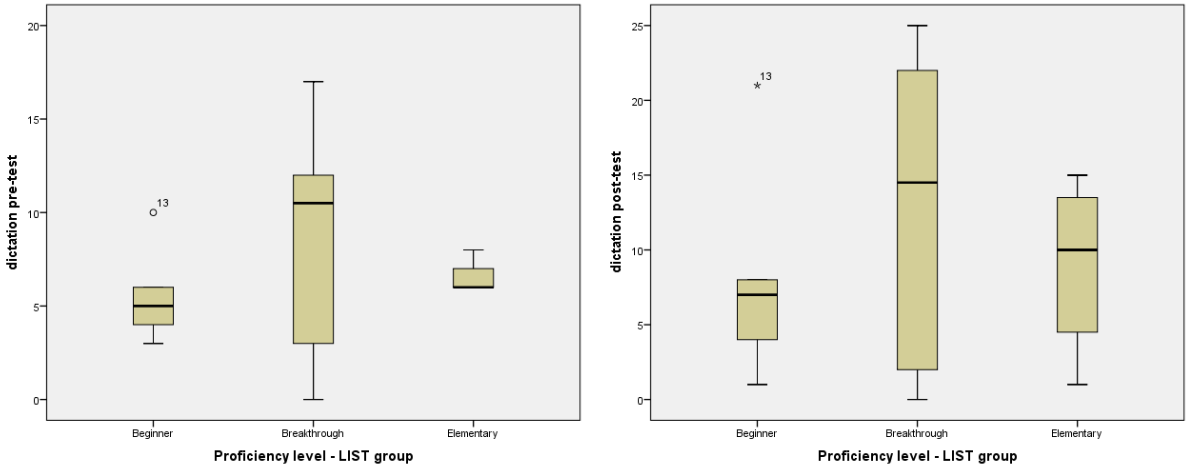
Appendix J.4: TTM group dictation task pre-test and post test



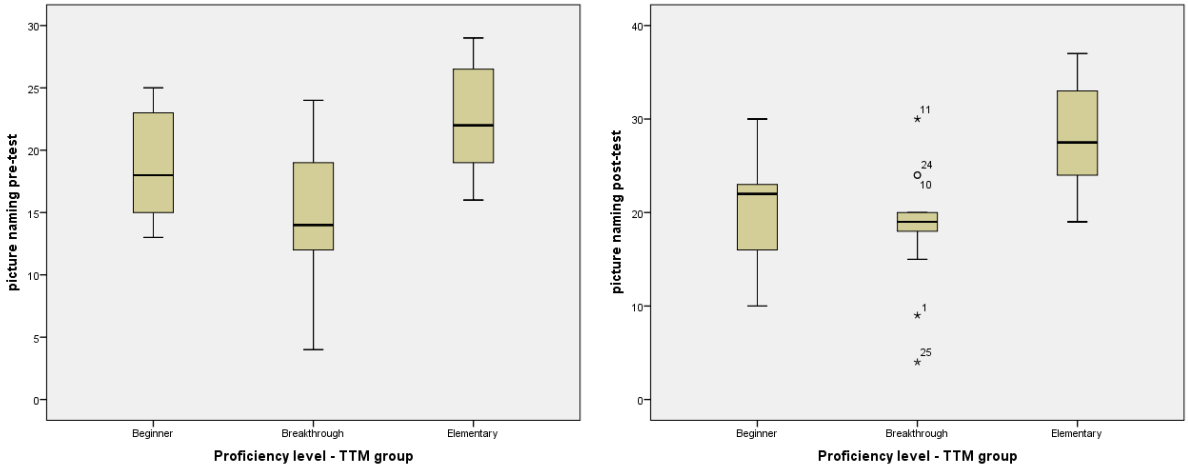
Appendix J.5: LIST + ORTH group dictation task pre-test and post-test



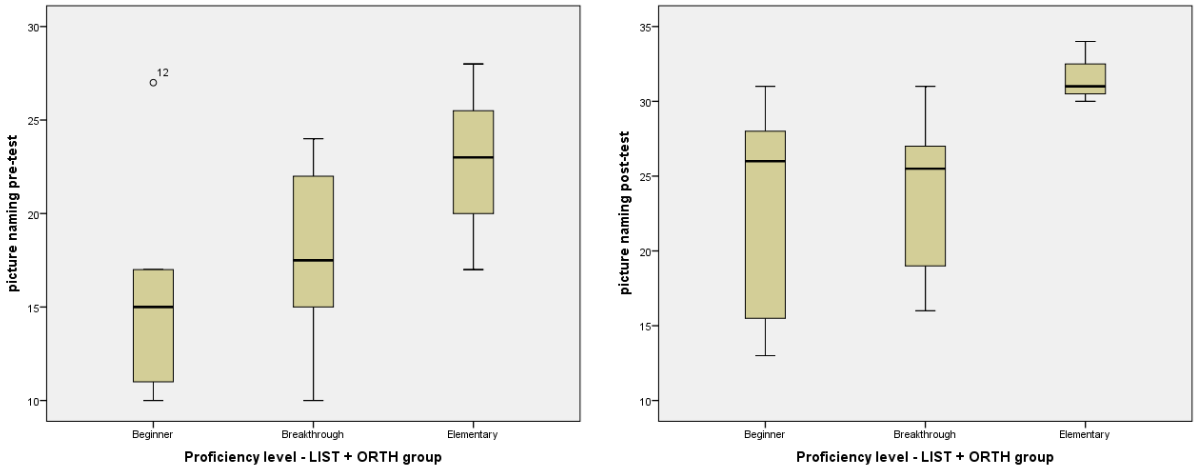
Appendix J.6: LIST group dictation task pre-test and post-test



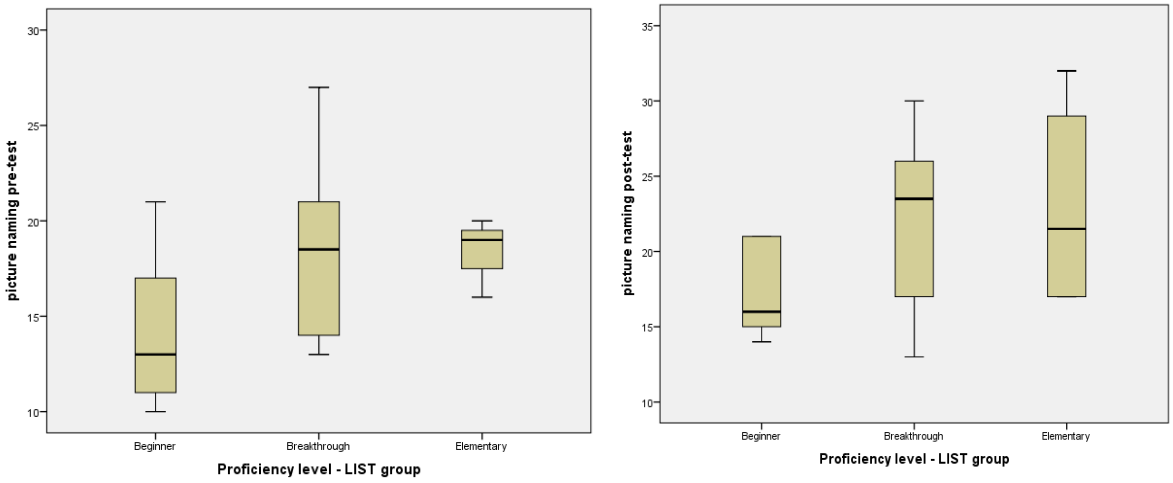
Appendix J.7: TTM group picture-naming task pre-test and post-test



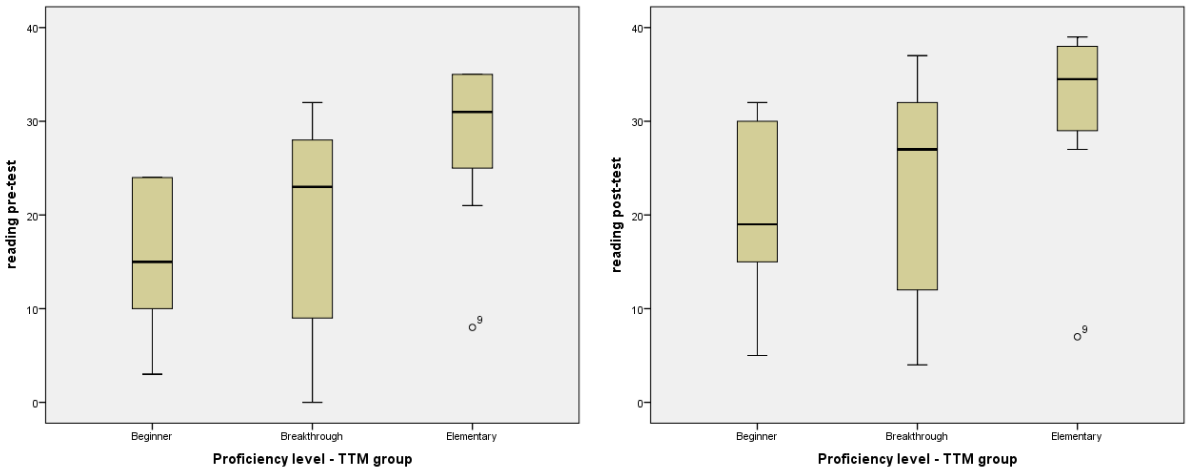
Appendix J.8: LIST + ORTH group picture-naming task pre-test and post-test



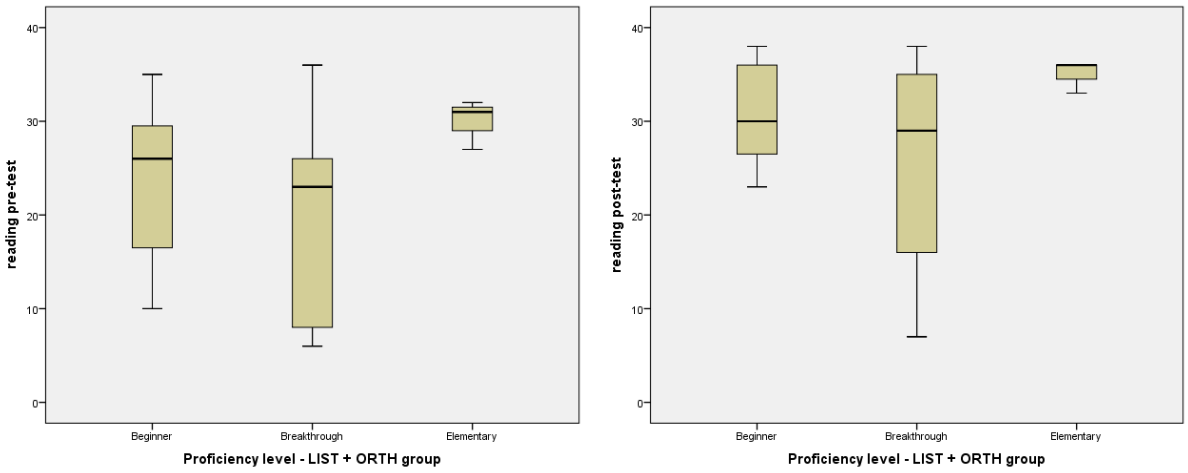
Appendix J.9: LIST group picture-naming task pre-test and post test



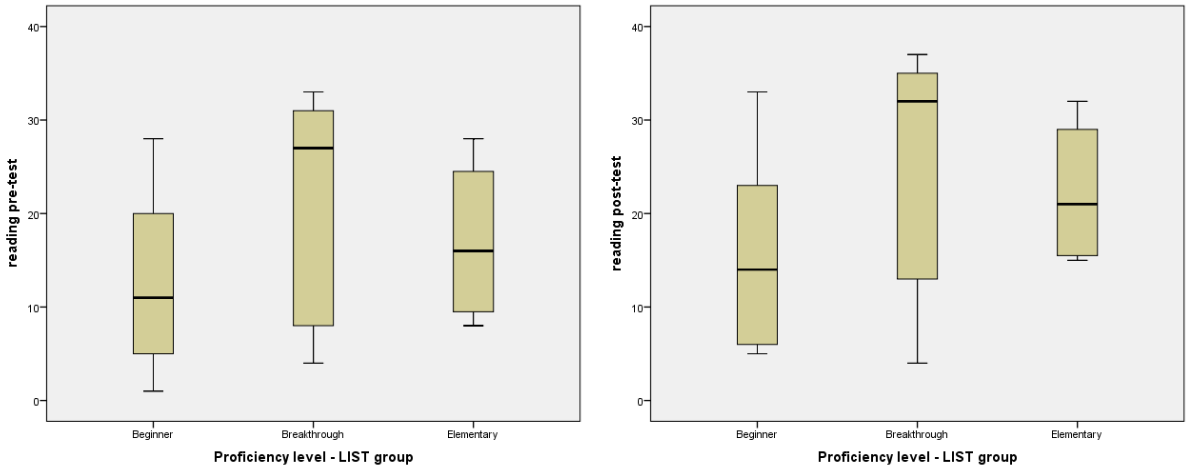
Appendix J.10: TTM group reading task pre-test and post-test



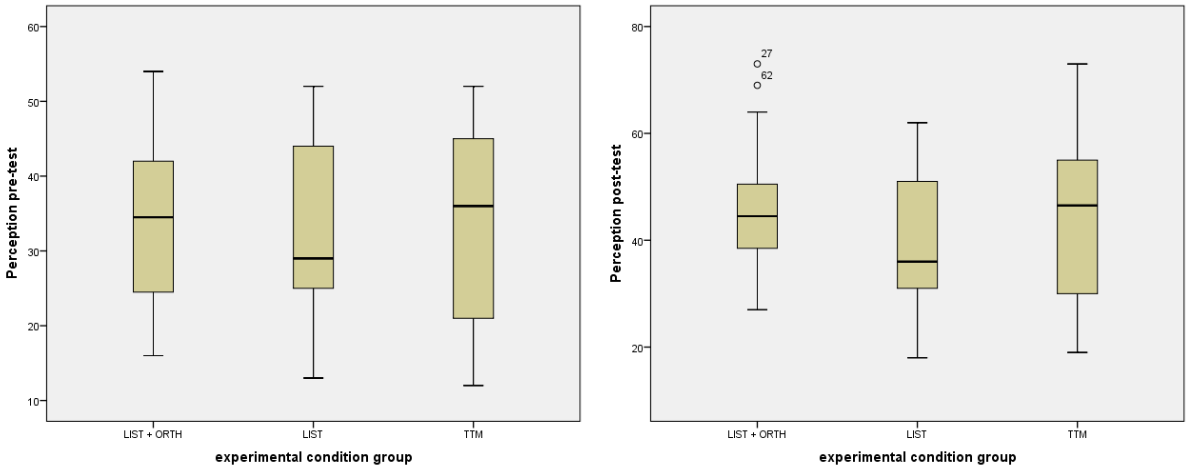
Appendix J.11: LIST + ORTH group reading task pre-test and post-test



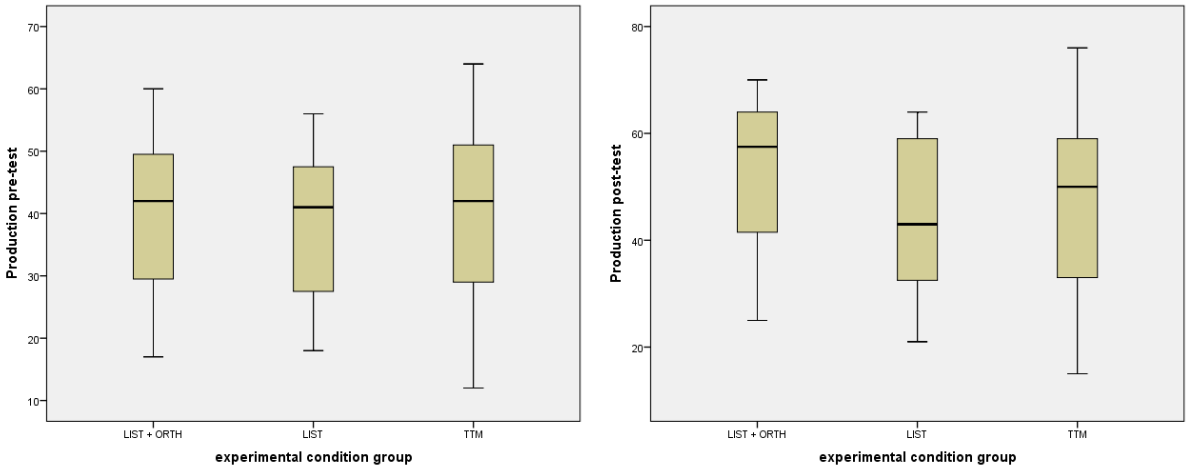
Appendix J.12: LIST group reading task



Appendix J.13: Perception test correlation



Appendix J.14: Production test correlation



Appendix K: Mean scores table by effect of instruction

Appendix K.1: Epenthesis task

Experimental condition group		**LIST + ORTH**		**LIST**		**TTM**	
Tests		Pre	Post	Pre	Post	Pre	Post
Epenthesis task	Mean	25.96	30.67	25.13	28.48	26.19	31.12
	Diff.	4.71		3.35		4.93*	

Appendix K.2: Dictation task

Experimental condition group		**LIST + ORTH**		**LIST**		**TTM**	
Tests		Pre	Post	Pre	Post	Pre	Post
Dictation task	Mean	8.17	15.29	7.43	11.26	7.77	13.27
	Diff.	7.12*		3.83		5.5	

Appendix K.3: Picture-naming task

Experimental condition group		**LIST + ORTH**		**LIST**		**TTM**	
Tests		Pre	Post	Pre	Post	Pre	Post
Picture-naming task	Mean	17.71	24.42	17.13	21.13	18.08	21.79
	Diff.	6.71*		4		3.71	

Appendix K.4: Reading aloud task

Experimental condition group		**LIST + ORTH**		**LIST**		**TTM**	
Tests		Pre	Post	Pre	Post	Pre	Post
Reading task	Mean	22.96	29.65	20.17	23.48	21.62	24.88
	Diff.	6.69*		3.31		3.26	

Appendix L: Mean score tables by proficiency level

Appendix L.1: TTM group epenthesis task

Proficiency levels		Beginner-level		Breakthrough-level		Elementary-level	
Tests		Pre	Post	Pre	Post	Pre	Post
TTM group	Mean	21.8	28.8	26	30	31.71	36
	Diff.	7*		4		4.3	

Appendix L.2: LIST + ORTH group epenthesis task

Proficiency levels		Beginner-level		Breakthrough-level		Elementary-level	
Tests		Pre	Post	Pre	Post	Pre	Post
LIST + ORTH Group	Mean	17.2	27.2	27.36	31	34.67	37.33
	Diff.	10*		3.64		2.66	

Appendix L.3: LIST group epenthesis task

Proficiency levels		Beginner-level		Breakthrough-level		Elementary-level	
Tests		Pre	Post	Pre	Post	Pre	Post
LIST group	Mean	23.4	31.2	23.71	27.07	29	29.75
	Diff.	7.8*		3.36		0.75	

Appendix L.4: TTM group dictation task

Proficiency levels		Beginner-level		Breakthrough-level		Elementary-level	
Tests		Pre	Post	Pre	Post	Pre	Post
TTM group	Mean	4	7.6	6.62	11.92	12	19
	Diff.	3.6		5.3		7*	

Appendix L.5: LIST + ORTH group dictation task

Proficiency levels		Beginner-level		Breakthrough-level		Elementary-level	
Tests		Pre	Post	Pre	Post	Pre	Post
LIST + ORTH Group	Mean	9	15.57	6.64	12.64	13.33	27
	Diff.	6.57		6		13.67*	

Appendix L.6: LIST group dictation task

Proficiency levels		Beginner-level		Breakthrough-level		Elementary-level	
Tests		Pre	Post	Pre	Post	Pre	Post
LIST group	Mean	4.5	5	8.36	13	6.5	9
	Diff.	0.5		3.36*		2.5	

Appendix L.7: TTM group picture-naming task

Proficiency levels		Beginner-level		Breakthrough-level		Elementary-level	
Tests		Pre	Post	Pre	Post	Pre	Post
TTM group	Mean	18.8	20.2	14.63	18.38	22.5	28.13
	Diff.	1.4		3.75		5.63*	

Appendix L.8: LIST + ORTH group picture-naming task

Proficiency levels		Beginner-level		Breakthrough-level		Elementary-level	
Tests		Pre	Post	Pre	Post	Pre	Post
LIST + ORTH Group	Mean	13.5	21	17.79	23.86	22.67	31.67
	Diff.	7.5		6.07		9*	

Appendix L.9: LIST group picture-naming task

Proficiency levels		Beginner-level		Breakthrough-level		Elementary-level	
Tests		Pre	Post	Pre	Post	Pre	Post
LIST group	Mean	14.4	17.4	18.43	21.93	18.5	23
	Diff.	3		3.5		4.5*	

Appendix L.10: TTM group reading task

Proficiency levels		Beginner-level		Breakthrough-level		Elementary-level	
Tests		Pre	Post	Pre	Post	Pre	Post
TTM group	Mean score	15.2	20.2	20.08	22.85	31	34.57
	Diff.	5*		2.77		3.57	

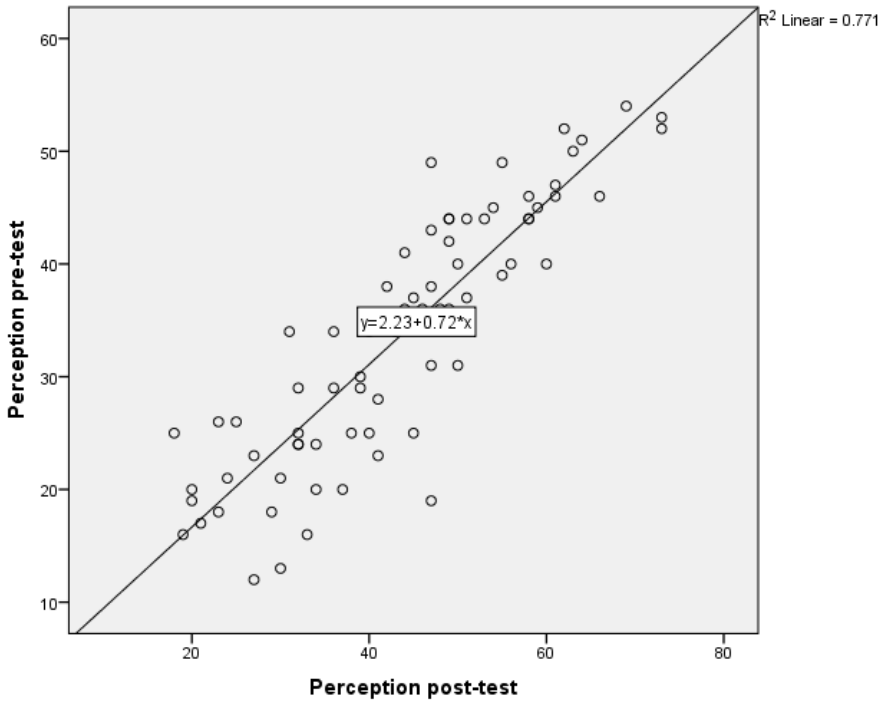
Appendix L.11: LIST + ORTH group reading task

Proficiency levels		Beginner-level		Breakthrough-level		Elementary-level	
Tests		Pre	Post	Pre	Post	Pre	Post
LIST + ORTH Group	Mean score	23.29	30.86	20.07	26.29	30	35
	Diff.	7.57*		6.22		5	

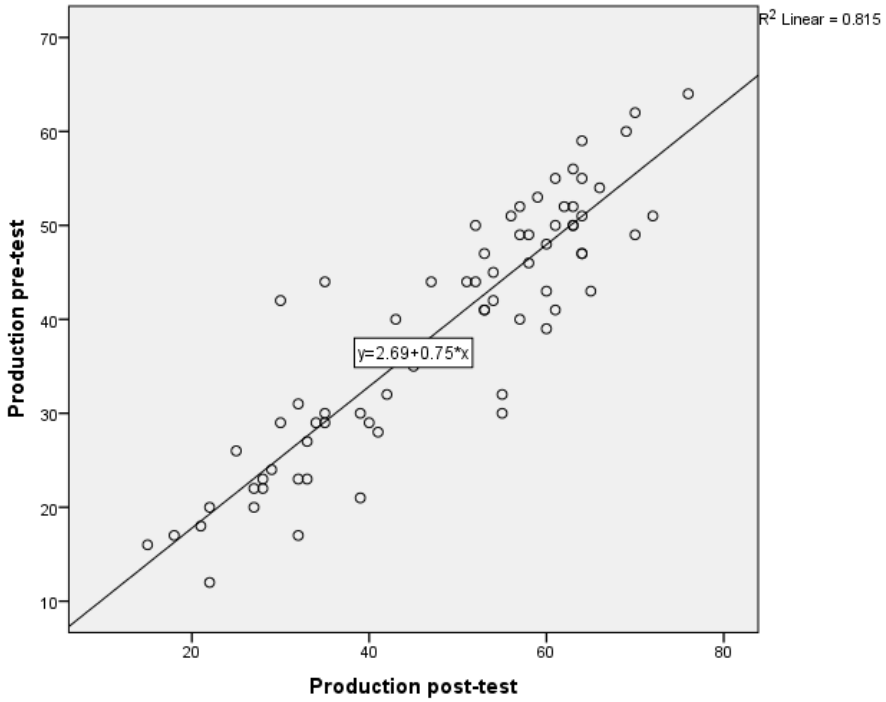
Appendix L.12: LIST group reading task

Proficiency levels		Beginner-level		Breakthrough-level		Elementary-level	
Tests		Pre	Post	Pre	Post	Pre	Post
LIST group	Mean score	13	16.2	22.36	25.5	17	22.25
	Diff.	3.2		2.84		5.25*	

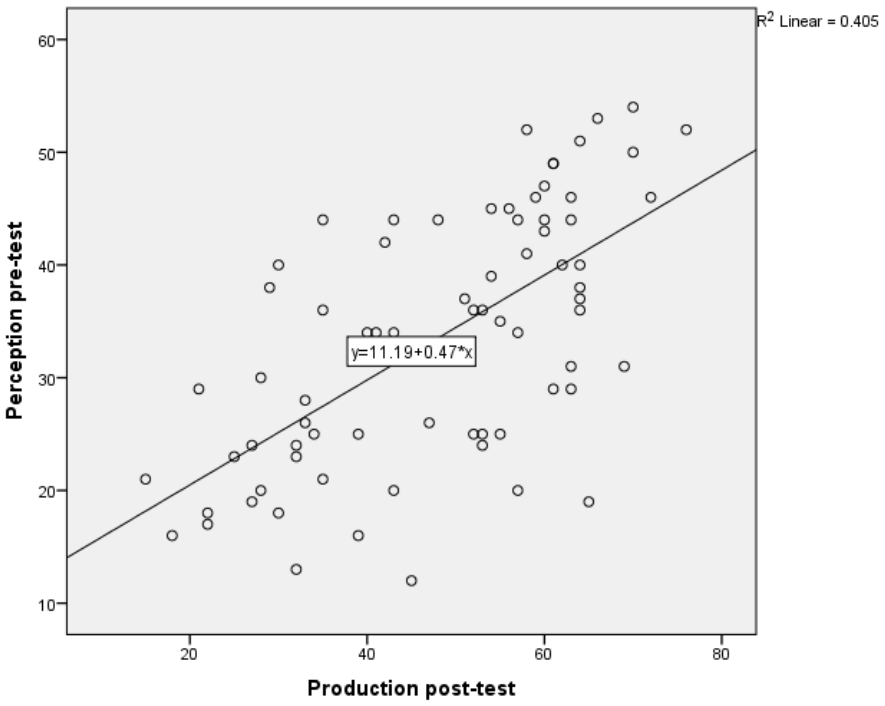
Appendix M: Scattered plots of production and perception correlation



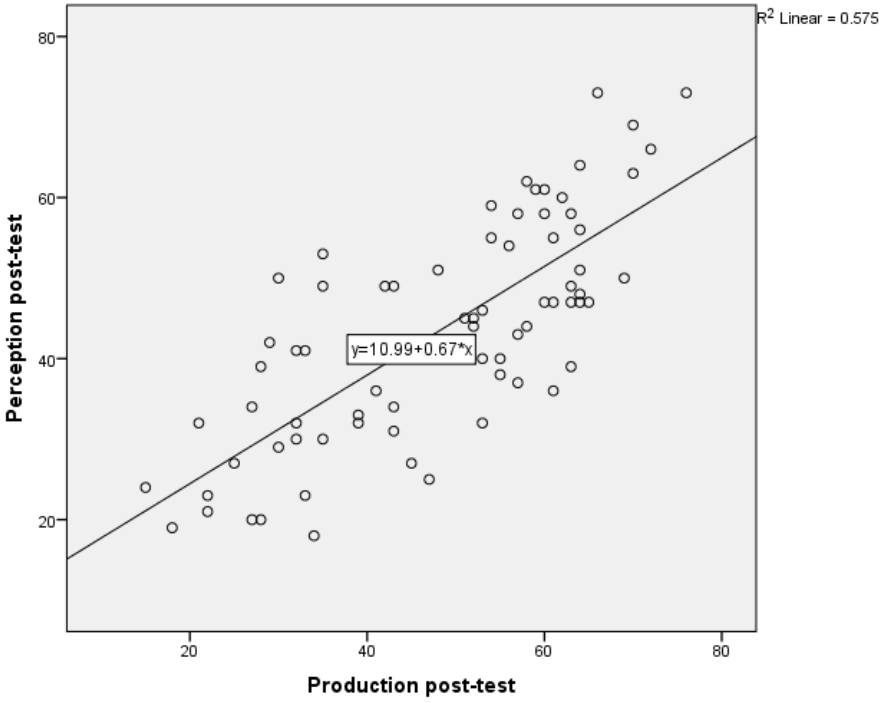
Perception pre-test vs perception post-test



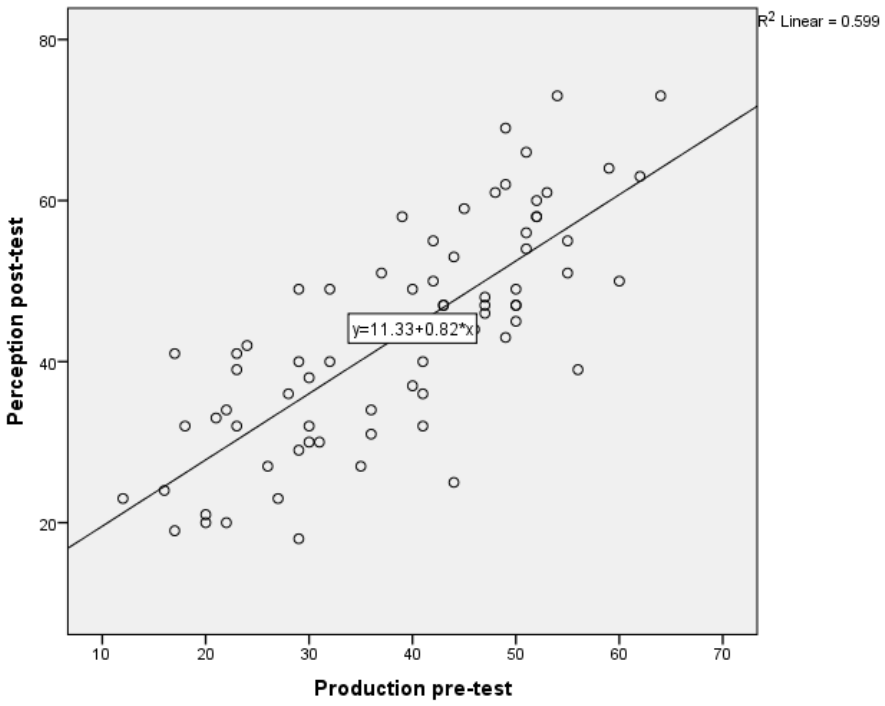
Production pre-test vs production post-test



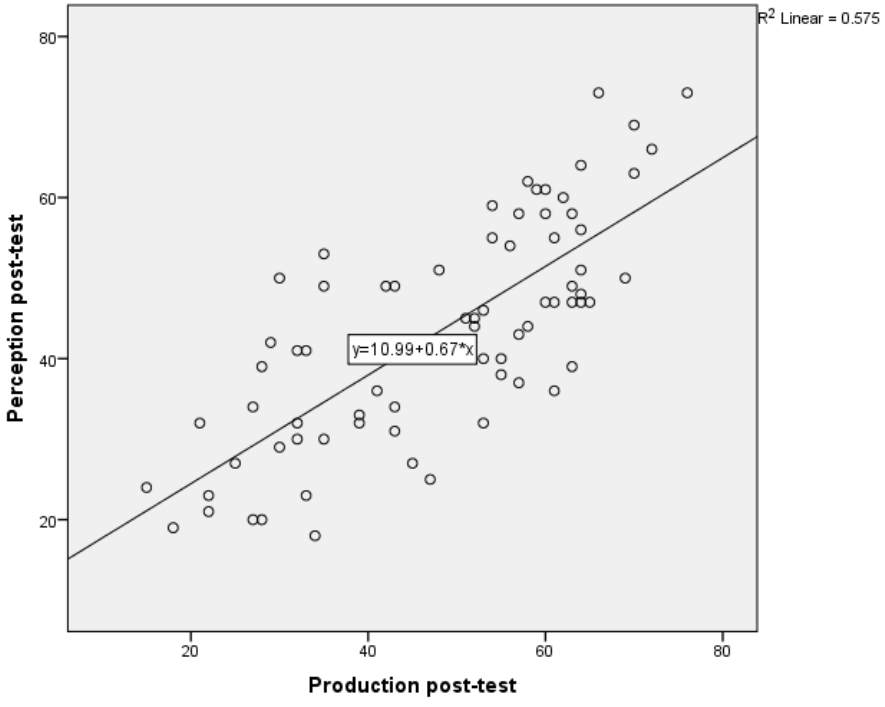
Perception pre-test vs production post-test



Perception post-test vs production post-test



Perception post-test vs production pre-test



Perception post-test vs production post-test

Appendix N: Instruments for data collection (English version)

Appendix N.1: Participant information sheet

PARTICIPANT INFORMATION SHEET

Title of project: Production and perception of written and spoken English by Tera speakers.

Name of supervisors: Dr S.J. Hannahs, Professor Martha Young-Scholten

Email: s.j.hannahs@ncl.ac.uk Mobile: +44(0)1912083400, martha.young-scholten@ncl.ac.uk Mobile: +44 (0) 191 208 7751

Name of researcher: Rebecca Ishaku Musa

Email: r.i.musa@ncl.ac.uk Mobile: +447740281377

Contact address: School of English Literature language and Linguistics, Percy Building, Newcastle University, Newcastle upon Tyne, Tyne and Wear, NE1 7RU, United Kingdom.

You are invited to participate in a project on the above title by the above mentioned researcher. Before you decide to take part in the project, you need to understand some basic information on why the research is being conducted. Please take your time to read the information on this form before deciding to participate in the project and do feel free to ask any question or clarity on the information provided.

Purpose and aims of the research

The purpose of this research is to examine the difficulties faced by Tera learners of English in the production and perception of the written and spoken forms of English using different methods of instruction to teach oral English. Research of this type is important because the findings could inform best methods of teaching oral English and recommendations for improvement can be drawn from it.

Participation selection

You have been approached to participate in this project because you are a native speaker of Tera who is learning oral English in secondary school.

Voluntary participation

Your participation in this project is entirely voluntary. If you decide to participate, you will be asked to sign a consent form to indicate your willingness to participate. You have the right to withdraw your consent and participation at any time without any consequences. You only need to notify the researcher beforehand. If you withdraw, your data will only be used if you permit the researcher to do so. Otherwise it will be destroyed.

What is involved in participating?

If you agree to participate in this project, you will be asked to take a quick placement test and then participate in a 10 to 15 minute one-to-one interview with the researcher. During this interview you will be asked to do some exercises which include looking at pictures on a computer and saying the name of the item in the picture; reading some words, and writing some words after listening to them on a tape player. Afterwards, you will be taught once every week in a 20 minute session over a period of 4 weeks. At the end of the 4 weeks sessions, you will repeat the 10 to 15 minute interview with the researcher. The interview will be recorded using a digital recorder. No financial reward will be given to you for participating. However, educational materials such as books and pens **may** be given at the end of the project as appreciation.

Benefits and risk

Participation does not involve any known or anticipated risk for you. However, participation may cause inconvenience as it will require 20 minutes of your time for a duration of four weeks. The potential benefits associated with your participation include the fact that you will be learning with new exciting methods which could help improve your spoken English. You may also receive some books and pens at the end of the project.

Anonymity and confidentiality

In both written and verbal reports of this research, your real name will never be used; rather pseudonym or code will be used. Also, the names of people referred to will be changed in the course of transcriptions and deleted from the recordings.

Confidentiality, storage and usage of data

Your confidentiality and that of the data will be protected during and after the research. The recordings and other documents will be stored in password-secured computers and password-secured server. Hard copies of transcriptions and other information documents will be stored in a locked cabinet accessible only to the researcher.

Dissemination of result

It is anticipated that the result of this study will be shared by the researcher in publications, presentation, teaching, and training.

Further information and contact details

If you have any questions or concerns about this project, or would like more information about this project, please do not hesitate to contact the researcher or her supervisors using the details above.

Appendix N.2: Participant consent form

CONSENT FORM

Name of supervisors: Dr S.J. Hannahs, Professor Martha Young-Scholten

Email: s.j.hannahs@ncl.ac.uk Mobile: +44(0)1912083400, martha.young-scholten@ncl.ac.uk Mobile: +44 (0) 191 208 7751

Name of researcher: Rebecca Ishaku Musa

Email: r.i.musa@ncl.ac.uk Mobile: +447740281377

Contact address: School of English Literature language and Linguistics, Percy Building, Newcastle University, Newcastle upon Tyne, Tyne and Wear, NE1 7RU, United Kingdom.

I, the undersigned participant confirm that (please tick box appropriately):

1	I have read and understood the information about the project as provided on the information sheet.	☐
2	I have been given the opportunity to ask questions about the project and my participation.	☐
3	I agree to voluntarily take part in the project	☐
4	I understand that I can withdraw at any time without giving reasons or being penalised nor will I be questioned for withdrawing.	☐
5	I understand that a voice recorder will be used to collect data and I agree to my voice being recorded for the purpose of this research project	☐
6	The procedures regarding confidentiality and anonymity have been clearly explained to me.	☐
7	I understand that the recording of my voice and other accompanying materials may be stored in password-protected files computers.	☐
8	I understand that anonymised extracts of my data may be used in research, publication, public presentation, teaching, training purposes,	☐
9	Storage and usage of data has been explained to me	☐
10	I understand that I will receive no payment as incentive for my participation in this project.	☐

Name of participant giving consent ----------

Signature of participant ----------

Name & Signature of parent/legal guardian ----------

Date ----------

Name of researcher taking consent ----------

Signature of researcher ----------

Date ----------

Appendix N.3: Participant Risk assessment document

PARTICIPANT RISK ASSESSMENT

Physical risk

1. The equipment that will be used in the study includes digital recorder and laptop which can easily be used by the researcher and will not cause any risk or discomfort to the participants.
2. There is no risk of having participants travel to another location for this research because the study is going to be conducted in their schools.

Psychological risk

1. There is no known psychological risk associated with this research.

Environmental risk

1. The study locations are in Gombe state, one of the states in Northern Nigeria that the FCO advised against travels to for safety and security reasons. Therefore, in the event of any unanticipated environmental risk which may cause physical injury e.g. a terrorist attack, the safety of the participants and researcher will be considered most important. The research will be suspended and we will all return home immediately where it is safe to do so and strictly follow the local security warnings and advice.

Appendix N.4: Participant debriefing document

PARTICIPANT DEBRIEFING SHEET

I, the undersigned researcher wish to render my profound gratitude to all the participants, participants' parents/legal guardians and the gatekeepers of the schools for your cooperation and for agreeing to take part in my research project titled**:** Orthography vs. phonological representations: L2 English production and perception by L1 Tera speakers. As a coda stage of this research, I wish to debrief you on the project process as follows:

Purpose of the project

The research examined the difficulties in the production and perception of English orthography (written) and phonological (spoken) representations by Tera learners of English as a second language and conducted an intervention procedure using different methods in teaching oral English. The research is important because the findings could inform best methods of teaching oral English and recommendations for improvement can be drawn.

Availability of result

The data which I collected form you in recorded oral interviews and written tasks will be analysed using a sound analysis software called PRAAT and a statistical analysis software called SPSS within the next three months from the last day of this research. The result will then be available with me and can be made available to you on request.

Methodology use

The reason that I grouped you into three different experimental groups and used different methods for the teaching process is to test which method is most effective and learner friendly; by so doing to suggest for its adoption in teaching oral English. In addition, some of the words that I used in the stimuli are not real words; they were only used to test your production and perception of unknown words in learning your second language.

Queries, feedback and contact

I will be delighted to get feedback from you about the process of this study and you are welcome to ask any question or clarification as regards the study. In case you need further information about this study, you can contact me or my supervisors using the following information:

Name of supervisors: Dr S.J. Hannahs, Professor Martha Young-Scholten

Email: s.j.hannahs@ncl.ac.uk Mobile: +44(0)1912083400, martha.young-scholten@ncl.ac.uk Mobile: +44 (0) 191 208 7751

Name of researcher: Rebecca Ishaku Musa

Email: r.i.musa@ncl.ac.uk Mobile: +447740281377

Researcher's name ---------- Signature ---------- Date ----------

Appendix N.5: Participant recruitment questionnaire

PARTICIPANT RECRUITMENT QUESTIONNAIRE

School code: _____ Participant code: _____

Section A: Personal Information

1. Gender: Male ☐ Female ☐

2. Age: _____

3. Class: _____

4. Place of birth: _____

5. Place of residence: _____

Section B: Knowledge and use of language

6. What is your native language? _____

7. What is your father's native language: _____

8. What is your mother's native language: _____

9. How many languages can you speak? _____

10. Mention them starting with the most fluent to the least fluent. _____

11. Which language do you use in the following places:

a. Home _____

b. School _____

c. Play _____

Section C: L2 usage

12. Can you speak English? Yes ☐ No ☐

13. Can you write in English? Yes ☐ No ☐

14. At what age did you start learning English? _____

15. In what language were you taught in the following:

a. Primary school_____

b. Secondary school_____

16. In what language were you taught the English Subject_____

17. How would you describe the way that English language in general was taught to you? (Select only one)

a) Very poor

b) Poor

c) Good

d) Very good

e) Excellent

18. How would you describe the way that oral English was taught to you? (Select only one)

a) Very poor

b) Poor

c) Good

d) Very good

e) Excellent

Appendix O: Instruments for data collection (Tera version)

Appendix O.1: Participant information document

PARTICIPANT INFORMATION SHEET (TERA)

LAGARKATI YIN PITLA YE NIYIRIKU YEMA KWANYIRI

Nyin kwanyira: zur pitli ndi dar mbu bular me nasara mbu celewu nyimatliku

Dlum mallumkwa: Dr S.J. Hannahs, Profesor Martha Young-Scholten

Njiv gwar war email: s.j.hannahs@ncl.ac.uk Lambe waya: +44 (0) 191 208 3400, martha.young-scholten@ncl.ac.uk Lambe waya: +44 (0) 191 208 7751

Dlum nu ngguti mbanang: Rebecca Ishaku Musa

Njiv gwar nda email: r.i.musa@ncl.ac.uk Lambe waya khar: +447740281377

Manike gwana nda: Ma shogar ghwati lagarkatiku, me ghai ndu me ghin, ye nggufi ye chiti nu Newcastle, Newcastle vid ɗyine Tyne, Tyne ndu Wear, NE1 7RU, United Kingdom.

A kalaro ma a ɓana yema taba ɗyine pitli nu bulakin vid ɗyin kwanyir nuke bularan vid ɗyin lagarkatinang, nuke nu ngguti mbanang bulaki dlumang nivid. Kafin tloghana ma yiri yema kwanyira, wa shipa dana mbu ɓenyi yin ɓalara kwamni ɗyinike amma shi kwanyiran ni ɗyinan. Dana sarchi to ngud ɗyeciti nu kya mbu lagarkatina ni kap yinsi ɓalar ni kya mbu kwanyira.

Dyi nu saki ma kwanyira

Dyi nu saki nga ma kwanyira chinke bummi bonye nu nyimatli ka gwaki yema shogar me nasara ni dar mbu bulakandi nu ndi zikandi kwamni shir tlina ni njib zumzumndi ma shogar me nasare zikandi. Poni njib kwanyina botasi kume ngguti san ka ɗuma vur shaware ve njib nu dukki yema shagor menasare zikandi kom nu vurti saware mbarkandi yema shoga.

Dati nuyiriku ma tabari

Wa khuloro ma tabara ɗyine kwanyira kume to nimatli nuke khar lenda ta ɗyin shoga menasare zinkandi yema ngguti ye chiti nu sakandare.

Gwar yiri nu shimndi memuna

Gwanava yema mburi mban nu shimndi menuro guma da. Mbu ta tlogha yiri yema mburi mbanang, ka vur lagarkati tlogar yero kume sana kharo yang zalale kharo nuke dudna va ɓar konyi sarchi. Mbuta dudva ɓara amshi bote ndu bularku no vurkyawa saini tloghar ɓaro.

Dyi nu kya nje mbu tabarang

Mbu ta tlogha ma yiri yema ngguti mbanang, ka shi puji nu to mbu minti 10 mayi 15 suyen ndu nu ngguti mbanang. Mbu pijirang tukwa tlogha zhamndi nu tabaki ndu ngguti njimbi tunku mbu komfita, kom to zu ɗyi nu kya mbu njibyang; nggut mbu ɗye chiti; bulo ɗye citi nuke tukwa ngaki dlumdoro nubmu ɗye dar balar wu nasara. Ganje na kashi shoga yero me minti 20 sar kada mbu konyi qaandi mut har me gomar 4. Ganje shogarang tukwa gap to shi piji poni nu guma suyen ndu nu ngguti mbanang. Kashi bota ndi ɗye dar suqur ɓu nasara ma ku da pijirang. Wadarsan wu vur mizhinwa kume yirawa. Yang ka duma vur lagarkatiku nu ɗye bulari vu wadarsi kwanyira.

Bote ndu asar nu mban

Zinnje vid ɗyine asar nike ka gwaki nduk yema kwanyawa, yang kume ka kala minti 20 mbu konyi qaandi mut har sar 4 ka ɗuma tu hama ɗye damta kodom ye nu yi ma tabara. Bote nukya mbu kwanyina wa tabani zinndi mewar njib shoga zumzumndi mbarkandi nuke ka shataki shogar zir me nasara. Kwata san tukwa ɗuma togwa mbarkir lagarkatiku nu ɗye bulari.

Tuka nu kangarva

Pili dar sukur ɓalara ka khama tukaran mbu zirsi ɓalar nike ka shiki mbu labti zhindina wushi tlina nu dlum nduk wa, yang ka tukwa sukur ɓalar nu dakya gha kwam kashi tlina nu dlim kwatama. Mbu wa shi tlina nu dlum nduk tuk kawa hedwar kap mbu ɗye bulara vu sarchi ɓekti mbuɗyin ɓalara nishiki kwanya niɗyinan

Mburi ɗyin ndungndi ndu bote nu gwar ɗyin mbu shogarang

Ka tukwa asir wa gha kap nu ɗyino ziki yema tabara nu guma fan. Ka dingha kap suyen nu ɓena ɗye tlinara mbu komfita yama tukwakandi ka ndung mbu lagarkati ni shiki bulara nusa gha, tu khigha mbu golong tukwakandi she nu ngguti mbanang ndu mallum ɓaran

Mburi ɗyin ndungndi ndu bote ndu gwar ɗyin bu shogarang

A sa memunaran ye shir tlinar nu kwanyina ye lapti mbu shogari, ngguti mban, zursan, ndu vurti shogar ye nu lapti zundikwu.

Labti shwatar

Mbu ke zhamndi nggura nje kharo a damta vid ɗyine nggutti mban a ta labkya shwatar qundi mban, suburna sarci wa to lab nu ngguti mbanang ko malum ɓaran vid ɗyine maa nuke to ka gwaki nda nu ke bularan vid lagarkatina.

Appendix O.2: Participant consent form

CONSENT FORM (TERA)

LAGARKATI TLOGAR YIMA TABA

Dlum mallumkwa: Dr S.J. Hannahs, Profesor Martha Young-Scholten

Njiv gwar war email: s.j.hannahs@ncl.ac.uk Lambe waya: +44 (0) 191 208 3400, martha.young-scholten@ncl.ac.uk Lambe waya: +44 (0) 191 208 7751

Dlum nu ngguti mbanang: Rebecca Ishaku Musa

Njiv gwar nda email: r.i.musa@ncl.ac.uk Lambe waya khar: +447740281377

Manike gwana nda: Ma shogar ghwati lagarkatiku, me ghai ndu me ghin, ye nggufi ye chiti nu Newcastle, Newcastle vid ɗyine Tyne, Tyne ndu Wear, NE1 7RU, United Kingdom.

Nga, nu sar khar nu mbu lagartakina nga tlogharan za (so kha nu mbu akwachi ku nang)

1	Nga ngut ye cita yang nga da mbu kwanyi wanike to kalaki nu yine zur sana.	☐
2	Wa vir sarci shir zhem ya yine kwanyira kwam ni yiri ban yamarang	☐
3	Nga tlogha yiri yema kwanyira nu shimndi memunara.	☐
4	Nga ndamban ɗyine nga nɗuma dud vara konyi sarci ware damta.	☐
5	Nga ndamban za kashi tluna nu kulur ma da balar wanga, nga tlogha ɗyine ku da sukura nu mban.	☐
6	Wa yi pitli ya maɗyi ɗyine tukar su balar wanga.	☐
7	Nga ndamban ɗyine ka dung sukura ni ke amma daran nu beni ɗye tlinar kwanyira gha mbar maɗyi	☐
8	Nga ndamban ɗyine ka shi tluna nu sukura nu dakya ndu ɓeni pitlikwa yema shoga, ngguti mban, zursan, ndu vurti shogaran war nu lapti zundikwu.	☐
9	Washi pitli ya ɗyine ɗonar pitliɓanga.	☐
10	Nga ndamban za ama vur muzhinyawa ɗyine yiriwang ma tabar kwanyira	☐

Dlum nu yiri yema kwanyira ----------

Sar har nu yiri ----------

Dlum ndu sar khar wu nuharnda/nungiti nda ----------

Qaandi chere ----------

Dlum nu ngguti mbanang ----------

Sar khar wu nu ngguti mbanang ----------

Qaandi chere ----------

Appendix O.3: Participant debriefing document

PARTICIPANT DEBRIEFING SHEET (TERA)

LAGARKATI LAUDAR KWANYIRI

Nga, nukya sar khar nu bu lagarkati na kom ndu nu ngguti mbanang, nga shim wut kunar ɓanga ye nduki nu gwaki vaandan ma war yema ngguti mbana, zhinkirwar ndu mankirwar ndu nu ngguti, ndu nu ngguti ma shogarku nang kume shwatar wa nda ndu tloghar nun vurkiya yema kwanyirna nu dluman za: Zur pitli ndi dar mbu bular me nasara mbu celewu nyimatliku. Mbu laudarsi nggutibanang, gna shim vurnga koɗomma mbe duti khankal ɗyine zumndi guma mbu ngguti mbanang.

Dyi nu saki ma kwanyira

Mburi kwanyirna wa ngud mbu bonye nu nyimatliku a gwaranku yema shogar me ghai nasara ni dar mbu bulakandi nu ndi zikandi chele nyinatliku nukya shoga me ghai nasara mbu ye chiti sakandare. Kom tu shi tlina ni njib qunung yema shogar me nasare zikandi. Kwanyirna botasi kume laudarsan ka duma vur sawariku ve njiv nu dukki mbari yema shogar me nasare zikandi.

Dyi nu ɗalki mbu ɓirang

Ka zu mbu zur sanang nu dluki khanu ve njiv dar suqur ndu tlina nu dye muzu ɓu nasara yama zu mbu suqur nu ke ka qaaki PRAAT, tloghar zhamndang tuk nuke a nje bularan ka shi bote nu ɗye muzu ɓu nasara yema shiga lagarkata nuka kaki za SPSS. Ka zi mbanag nimbi cere kunung tun sarci wadar kwanyirang. Tloghar san aka kha suyen ndu nu nggutibanang ndu mallum baran. Kap njif nuke a shim ɗye biri ka ɗuma gwaran she wara.

Njivku nu shiki tlina si

Dyi nu saki tu shaktunu nigha san kunung kom ti shi tlina nu njib zumzumndi yema shogar chin ke kume ku bun jib nu dukki mbari yema shagar zur me nasare. Rong ma ɓeni ɗye chiti nu shiki tlina si yema vurti shogara yang ɗya ɗye chiti zinkandi ɓa. wana kanda a vi kume ku bu ko tun ka ɗuma zuran ndu dar mbu ɗye chiti nuke nun zun ɓa mbu me nasara.

Zham ndu shimndi memuna niyene kalar shatar zuni

Nga ka shi kasha nu tukti shimndi memunar ɓanu kom tang tlogha zhamndi ɗyine kwanyira, nu zur mbanu ɗyine mbanang. Mbuke tuna shim shwatar yerang mbu ɗyine kwanyira, tun ka duma kala nu ngguti mbanang ndu mallumku baran vid ɗyim ma wa wanang:

Dlum mallumkwa: Dr S.J. Hannahs, Profesor Martha Young-Scholten

Njiv gwar war email: s.j.hannahs@ncl.ac.uk Lambe waya: +44 (0) 191 208 3400, martha.young-scholten@ncl.ac.uk Lambe waya: +44 (0) 191 208 7751

Dlum nu ngguti mbanang: Rebecca Ishaku Musa

Njiv gwar nda email: r.i.musa@ncl.ac.uk Lambe waya khar: +447740281377

Dlum nu ngguti mbanang---------- Sar khar---------- Qaandi chere----------

Appendix O.4: Participant recruitment questionnaire

PARTICIPANT RECRUITMENT QUESTIONNAIRE (TERA)

LAGARKATI ZHAMNDI NU DAR NU YIRI KWANYIRI

Lambe tlati ɓu maa ngguti ye chitang: ☐ Lambe wu nu gwar yirang: ☐

Shaktan Nu A: Zundi nu yirikwang

1. Nusu mu khusku mu: Khusku ☐ Nusu ☐
2. Sonyiri: _____
3. Kib ngiti ɗye chiti: _____
4. Maa nu kharira: _____
5. maa nu ke to kharan: _____

Shaktan Nu B: zundi ndu bote ndu me ghai

6. Num ke meghai ɓara? _____
7. Num ke meghai ɓu zhinkir ɓaro? _____
8. Num ke meghai ɓu mankir ɓaro? _____
9. To maghakya zu me ghai kima? _____
10. Njel wara ji ɗyin nuke to maghaki mbar ma war she no maghaki mbar ɓa. _____
11. Taa bote ndu nyi meghai mbu yemaku nangang na?
    a) Kari _____
    b) Yema shogar ɗye citi _____
    c) Yema kulang _____

Shaktan Nu C: Shir bote ndu meghai ɓu nasara

12. Ta magha zu menasara mu? I ☐ O'o ☐
13. Ta magha bula ndu menasara mu? I ☐ O'o ☐

14. To nggasi shaga mbu me nasara mbu sonyi kima? _____

15. Nu meghai num shogaki yoro mbu maaku nangang:

    a) Maa shogar nu puramari _____
    b) Maa shogar nu sakandare _____

16. Nu meghai num shogaki darasi menasara yoro? _____

17. Tukwa ɗuma mbu njib nu shogaki menasara yo mu? (doɗba kada mban)

    a) Mbar maɗyi ɓa
    b) Mbar ɓa
    c) Mbar
    d) Mbar maɗyi
    e) Kha rakhan

18. Tukwa ɗuma mbu njib nu shogaki menasare zikandi yo mu (doɗba kada mban)?

    a) Mbar maɗyi ɓa
    b) Mbar ɓa
    c) Mbar
    d) Mbar maɗyi
    e) Kha rakhan

Appendix P: Instruments for data collection (Hausa version)

Appendix P.1: Participant information sheet

PARTICIPANT INFORMATION SHEET (HAUSA)

TAKARDAR BAYANI WA MAHALLARTAN NAZARI

Lakabin nazari: Lafazi da Fahimtan Rubutacce gaban Magantaccen Turanci a Tsakanin Terawa.

Sunan mallamai: Dr S.J. Hannahs, Profesor Martha Young-Scholten

Adireshin email: s.j.hannahs@ncl.ac.uk Lambar waya: +44 (0) 191 208 3400, martha.young-scholten@ncl.ac.uk Lambar waya: +44 (0) 191 208 7751

Sunan mai bincike: Rebecca Ishaku Musa

Adireshin email: r.i.musa@ncl.ac.uk Lambar waya: +447740281377

Adireshi: School of English Literature language and Linguistics, Percy Building, Newcastle University, Newcastle upon Tyne, Tyne and Wear, NE1 7RU, United Kingdom.

Ana gayattan ka/ki domin hallartar tsiwurwuri a kan batun lakabin da ke rubuce a saman takardar nan wanda mai binciken da sunan ta ke rubuce a sama za ta yi. Kamin ka/ki amince da hallartar wannan nazarin, ya kamata ka gane wassu mihiman bayanai da kuma dalilin wannan nazarin. Ka/ki dauki lokacin ka/ki karanta wannan takardar bayani da ke dauke da cikaken bayanai kan nazarin.

Munufa da makasudin nazarin

Manufan wannan nazarin shine domin a jarraba wahallolin da Terawa masu koyan Turanci ke fuskanta wajen lafazi da fahimtan bambancin tsakanin rubutacce gaban magantaccen Turanci tare da amfani da hanyoyin koyar da turancin baka. Irin wannan nazarin na da muhimmanci domin sakamakon binciken zai iya bada shawarwarai kan hanya mafi inganci don koyar da turancin baka, kuma a bada shawaran kyautata koyarwa.

Zaben mahallarta

An kusance ka/ki domin hallartar wannan nazarin domin kai/ke bateri/bateriya ne wanda ke kan koyan turancin baka a makarantar sakandare.

Hallarta da son rai

Hallartar ka/ki a wannan nazari da son r aka/ki ne gaba daya. Idan ka/ki amince da hallartar nazarin, za a baka/ki takardar yarda domin ka/ki saka hannu. Ka/ki na da daman janyewa a kowane lokaci ba tare da wani sakamako ba. Amma za ka/ki sanar da mai binciken a kan lokaci. Idan ka/ki janye ba za a yi amfani da bayanen da ka/ki bayar ba tare da iznin ka/ka/ ba.

Abin da hallarta ya kunsa

Idan ka/ki yarda ka/ki hallarci wannan nazari, za ka/ki yi hira da gwadawa cikin minti 10 zuwa 15 tare da mai bincike. A cikin hirar za ka/ki amsa tambayoyi da suka hada da duban hotuna a kan kwamfuta sai ka/ki fadi sunan abin da ke cikin hoton; karanta yan kalmomi; rubuta kalmomi da za ka/ki saurara daga tefrekoda. Bayan wannan, za a koyar ma ka/ki cikin minti 20 sau daya a sati na tsawon makonni 4 Daga karshen koyarwar, za ka/ki sake yin hirar irin ta farko cikin minti 10 zuwa 15 tare da mai binciken. Za a yi amfani da tefrekoda domin daukan hirar. Ba za a biya ka/ki kudi domin hallartar ka/ki ba. Amma, za a iya baka/ki littattafai da alkalami a karshen nazarin.

Amfani da kasada

Babu wani sannanen kasada wa masu hallartar wannan nazarin. Amma, domin za'a bukaci minti 20 cikin kowane mako na tsawon mako 4, zai iya zama da dan damuwa wa mahallarta. Amfanin da ke kunshe cikin nazarin nan sun hada da sanin cewa za ka/ki yi koyo da sabin hanyoyi masu ban sha'awa wanda za su iya taimaka inganta turancin bakar ka/ki. Daga baya kuma za ka/ki iya samun kyautar littattafai da alkalami.

Sirri da kariya

Daukar faifai na rikod da za'a yi zai zama a sirrance. Cikin rahoton da za a yi na wannan bincike, ba za'a yi amfani da sunnan ka/ki ba sai de lambar tsari ko kuma sunnan karya. Idan an yi amfani da sunayen mutane ta kowane hanya, za a cire su gabadaya daga rikod din a lokacin fassara sakamakon nazarin.

Kariya, ajiya da amfani da sakamakon nazarin

Za a kare sirrin ka/ki tare da duk bayanai da ka/ki bayar a lokacin nazarin da nan gaba. Za'a ajiye duk bayanai da sauran daftarin aikin tsare a cikin kwamfuta da saba masu Kalmar sirri. Za'a ajiye duk kwafin takardun aikin a kule a cikin kabad da ke kare a wurin mai bincike tare da mallamin ta.

Watsa sakamakon nazari

Ana san ran yin amfani da sakamakon nazarin nan wajen bincike, koyarwa, gabatarwa, da kuma horarwa wa dalibai.

Neman Karin bayani da adireshi

Idan ka/ki na da wani tambaya ko damuwa game da wannan nazarin ko kuma ka/ki na neman Karin bayani, kada ka/ki jinkirta ka/ki tuntubi mai bincike ko mallamin ta a kan adireshi da ke rubucce a sama.

Appendix P.2: Participant consent from

CONSENT FORM (HAUSA)

TAKARDAN YARDAN HALLARTA

Sunan mallamai: Dr S.J. Hannahs, Profesor Martha Young-Scholten

Adireshin email: s.j.hannahs@ncl.ac.uk Lambar waya: +44 (0) 191 208 3400, martha.young-scholten@ncl.ac.uk Lambar waya: +44 (0) 191 208 7751

Sunan mai bincike: Rebecca Ishaku Musa

Adireshin email: r.i.musa@ncl.ac.uk Lambar waya: +447740281377

Adireshi: Makarantar Wallafe-wallafe, Yare da Ilimin Harsuna, Jami'ar Newcastle, Newcastle upon Tyne, Tyne and Wear, NE1 7RU, United Kingdom.

Ni, mai sa hannu a wannan takarda na amince da cewa (cika a cikin akwatin)

1	Na karanta kuma na gane bayanin kan wannan nazarin yadda aka tanada akan takardan bayani.	☐
2	An bani daman yin tambaya akan nazarin da kuma hallarta na.	☐
3	Na yarda in hallarci wannan nazarin da son rai na.	☐
4	Na gane cewa zan iya janyewa a kowani lokaci ba tare da na bada dalili ba.	☐
5	Na gane cewa za a yi amfani da rediyo don daukan bayanai na kuma na amince a dauki murya na a kan rediyo.	☐
6	An yi min bayani sosai akan sirri da kariyar ajiye bayanai na.	☐
7	Na gane cewa za a ajiye murya na da za a dauka tare da sauran daftarin wannan nazarin da kyau sosai.	☐
8	Na gane cewa za a yi amfani da murya na da sauran bayanai na a wajen koyarwa, bincike, gabatarwa, da kuma horarwa wa dalibai.	☐
9	An yi min bayani a kan yada za'a kiyaye bayanai na.	☐
10	Na gane cewa ba za'a biya ni kudi domin hallartan wannan nazarin ba.	☐

Sunan mai hallartan nazari ----------

Sa hannu mai hallarta ----------

Suna da sa hunnun iyaye/mai kula da mai hallarta ----------

Kwanan wata ----------

Sunan mai bincike ----------

Sa hanun mai bincike ----------

Kwanan wata ----------

Appendix P.3: Participant debriefing document

PARTICIPANT DEBRIEFING SHEET (HAUSA)

TAKARDAR JAWABIN KAMALA NAZARI

Ni, mai sa hannu a wannan takardar kuma mai yin bincike, ina son in nuna godiya ta na musamman zuwa ga mahallartar wannan nazarin, iyayensu, da masu lura da makarantun nan domin goyon baya da yarda da ku ka bani wajen yin wannan nazari mai lakabi: **Lafazi da Fahimtan Rubutacce gaban Magantaccen Turanci a Tsakanin Terawa.** Cikin dakali na karshen wannan nazari, ina so in baku takaitaccen jawabi akan ci gaban wannan nazari.

Dalilin nazarin

Wannan nazarin ya jarraba wahallolin da Terawa suke fuskanta wajen lafazi da fahimtan bambancin rubutacce gaban magantaccen Turanci tsakanin Terawan da ke koyan harshen Turanci a makarantar sakandare to wurin yin amfani da hanyoyi kala uku wajen koyar da Turancin baka. Wannan nazarin na da muhimanci domin sakamakon binciken zai iya bada shawarwari kan hanya mafi inganci wajen koyarda turancin baka da kuma shawarwarin kyautata koyarwan.

Kasancewr sakamakon

Za'a fasara bayanen da aka karba wajen ku ta hanyan daukar murya da amfani da na'uran fasara murya wanda ake kira PRAAT, amsan tambayoyin kuma da ke a rubuce za'a yi amfani da na'uran lissafi da ake kira SPSS. Za a yi wannan fasara ne a cikin watani uku daga ranar gama wannan nazarin. Sakamakon zai kasance tare da mai binciken da mallamin ta. Duk mallarcin wannan nazarin da ke bukatar sakamakon zai iya samu a wurin su.

Hanyoyin da aka yi amfani da

Dalilin da yasa aka raba ku cikin rukuni uku kuma aka yi amfani da hanyoyi dabam-dabam wajen koyarwa shine domin a gwada wani hanya ne ya fi inganci da saukin amfani wajen koyarda da Turancin baka. Bugu da kari, sauran kalmomin da aka yi amfani da su wajen koyarwa ba asalin kalmomi bane. Hakan ya faru ne domin a gwada ko za ku iya lafazi da fahimtan kalmomin da ba ku sani ba a harshen Turanci.

Tambayoyi, ra'ayi da neman Karin bayani

Zan yi farin cikin jin ra'ayoyin ku game da tsarin wannan nazarin ni kuma amsa tambayoyi ko bayani kan wannan nazarin. Idan kuma kuna neman Karin bayani akan wannan nazarin, za ku iya tuntuban mai binciken ko mallaman ta a kan adireshi kamar haka:

Sunan mallamai: Dr S.J. Hannahs, Profesor Martha Young-Scholten

Adireshin email: s.j.hannahs@ncl.ac.uk Lambar waya: +44 (0) 191 208 3400, martha.young-scholten@ncl.ac.uk Lambar waya: +44 (0) 191 208 7751

Sunan mai bincike: Rebecca Ishaku Musa

Adireshin email: r.i.musa@ncl.ac.uk Lambar waya: +447740281377

Sunan mai bincike---------- Sa hannu ----------Kwanan wata ----------

Appendix P.4: Participant recruitment questionnaire

PARTICIPANT RECRUITMENT QUESTIONNAIRE (HAUSA)

LITTAFIN TAMBAYOYI NA DAUKAN MAHALLARTA

Lambar tsarin makaranta: _____ Lambar tsarin mahallarta: _____

Sashen A: Bayanin mahallarci

1. Jinsi: Namiji ☐ Mace ☐

2. Shekaru: _____

3. Aji: _____

4. Wurin haihuwa: _____

5. Wurin zama: _____

Sashen B: Sani da amfani da yare

6. Menene yaren ka/ki? _____

7. Menene yaren mahaifin ka/ki: _____

8. Menene yaren mahaifiyar ka/ki: _____

9. Yare nawa ka/ki iya fadi? _____

10. Fade su daga wanda ka/ki fi iyawa zuwa wanda ba ka/ki iya sosai ba. _____

11. Da wani yare ka/ki ke amfani a wadannan wurare:

a. Gida _____

b. Makaranta _____

c. Wurin wasa _____

Sashen C: Amfani da harshen Turanci

12. Ka/ki iya fadin harshen Turanci? I ☐ A'a ☐

13. Ka/ki iya rubutu da harshen Turanci? I ☐ A'a ☐

14. A shekara nawa ka/ki fara koyon harshen turanci? _____

15. Da wani yare aka koyar ma ka/ki a wadannan wurare:

a. Makarantar firamare _____

b. Makarantar sakandare _____

16. Da wani yare aka koyar ma ka/ki da darasin Turanci? _____

17. Ta yaya za ka/ki kwatanta yadda aka koyar ma ka/ki da darasin Turanci? (zaba daya kawai)

a) Ba kyau sosai
b) Ba kyau
c) Da kyau
d) Da kyau sosai
e) Mafifici

18. Ta yaya za ka/ki kwatanta yadda aka koyar ma ka/ki da Turancin baka? (zaba daya kawai)

f) Ba kyau sosai
g) Ba kyau
h) Da kyau
i) Da kyau sosai
j) Mafifici

Appendix Q: Local approval for conducting research

GOMBE STATE GOVERNMENT OF NIGERIA

STATE UNIVERSAL BASIC EDUCATION BOARD, GOMBE

Tel: 072-2231202
Fax: 072-223059

6 March, 2014

GM/SUBEB/OFF/S/37/VOL

Rebecca Ishaku Musa
School of English Literature
Languages and Linguistics
New Castle University
Pecy Building
New castle upon tyne
NE 17 RU

APPROVAL TO UNDERTAKE RESEACH AMONG JUNIOR SECONDARY SCHOOL STUDENTS

Reference to your letter dated 5 February, 2014, requesting to undertake research among junior secondary school students in Difa and Zanbuk Communities of Yamaltu Deba LGA, Gombe.

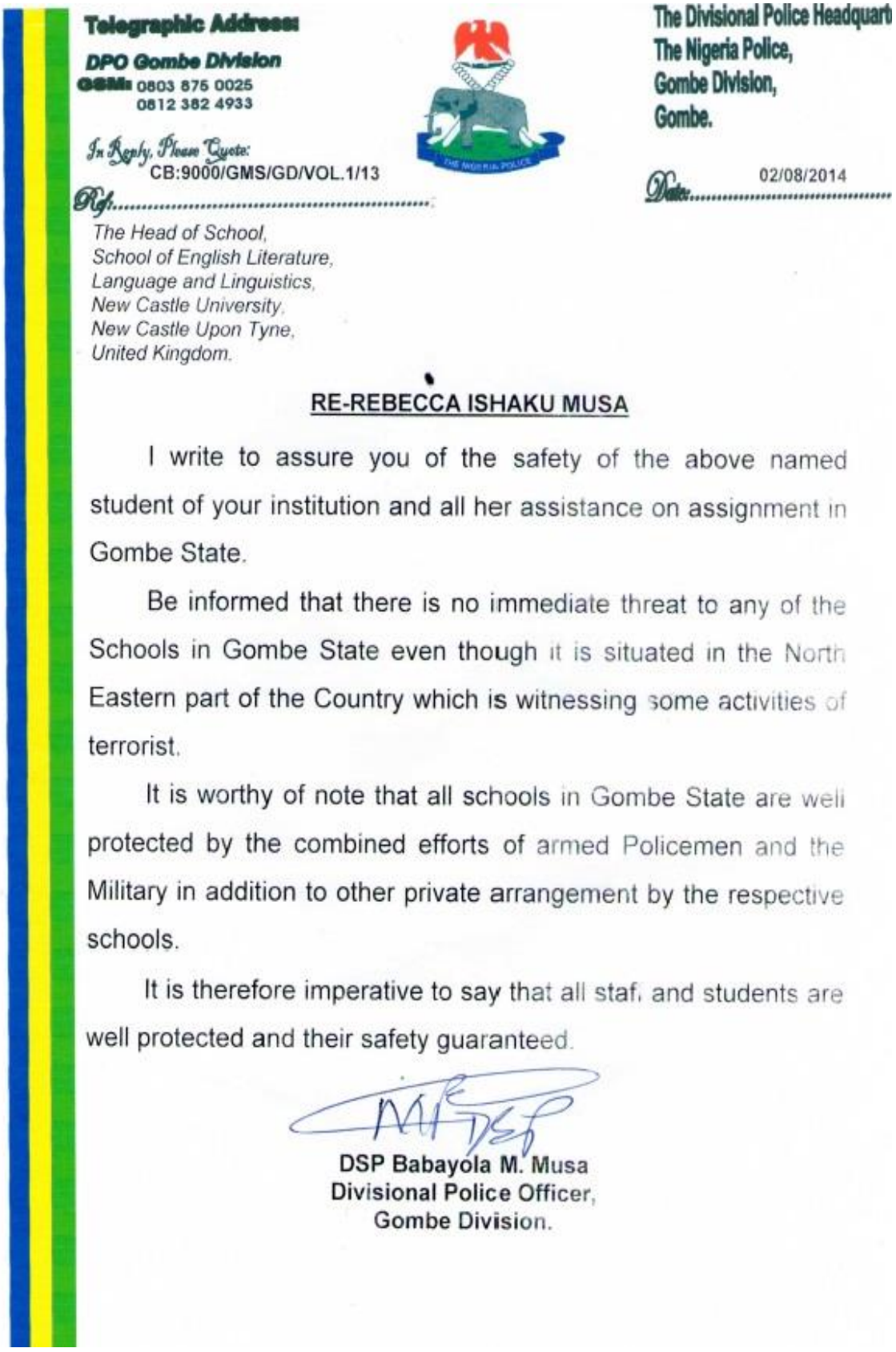
I wish to write and inform you that your request has been approved by the Executive Chairman.

Wishing you success in your research work.

Thanks.

Alh. Adamu Mohammad Salama
Board Secretary.

Appendix R: Local confirmation of security and safety



Telegraphic Address:
DPO Gombe Division
GSMs: 0803 875 0025
0812 382 4933

In Reply, Please Quote:
CB:9000/GMS/GD/VOL.1/13

Ref.....;

The Divisional Police Headquart
The Nigeria Police,
Gombe Division,
Gombe.

Date..... 02/08/2014

The Head of School,
School of English Literature,
Language and Linguistics,
New Castle University,
New Castle Upon Tyne,
United Kingdom.

RE-REBECCA ISHAKU MUSA

I write to assure you of the safety of the above named student of your institution and all her assistance on assignment in Gombe State.

Be informed that there is no immediate threat to any of the Schools in Gombe State even though it is situated in the North Eastern part of the Country which is witnessing some activities of terrorist.

It is worthy of note that all schools in Gombe State are well protected by the combined efforts of armed Policemen and the Military in addition to other private arrangement by the respective schools.

It is therefore imperative to say that all staff and students are well protected and their safety guaranteed.

DSP Babayola M. Musa
Divisional Police Officer,
Gombe Division.

Appendix S: Research assistants letter of consent

Government Day Secondary School Zambuk
YamaltuDeba Local Governemt Area
Gombe state
Nigeria.
21st July, 2014.

The Head of School
School of English Literature
Language and Linguistics
Newcastle University
Newcastle upon Tyne
United Kingdom.

Dear Sir,

LETTER OF CONSENT

I wish to write and acknowledge that I have been approached by Mrs Rebecca Ishaku Musa to serve as an assistant researcher in order to help in collecting the data for her research in Government Junior Secondary Schools Difa and Zambuk. I have understood the task and have consented to be an assistant researcher in the study. I have been trained by her and have also practiced the training among the students of the school where I work as an English Language teacher. I understand that my security and that of the students is very important and as such I will adhere to security warnings and advice at all times. All the documents used during the course of the study will be properly handled, securely packaged and posted to her by DHL on completion of the data collection.

Should you need more clarification on issues relating to the study, do not hesitate to contact me please.

Yours sincerely,

Mr. Hassan Mahdi
+2348133626161

Government Day Secondary School Zambuk
YamaltuDeba Local Governemt Area
Gombe state
Nigeria.
21st July, 2014.

The Head of School
School of English Literature
Language and Linguistics
Newcastle University
Newcastle upon Tyne
United Kingdom.

Dear Sir,

LETTER OF CONSENT

I wish to write and acknowledge that I have been approached by Mrs Rebecca Ishaku Musa to serve as an assistant researcher in order to help in collecting the data for her research in Government Junior Secondary Schools Difa and Zambuk. I have understood the task and have consented to be an assistant researcher in the study. I have been trained by her and have also practiced the training among the students of the school where I work as an English Language teacher. I understand that my security and that of the students is very important and as such I will adhere to security warnings and advice at all times. All the documents used during the course of the study will be properly handled, securely packaged and posted to her by DHL on completion of the data collection.

Should you need more clarification on issues relating to the study, do not hesitate to contact me please.

Yours sincerely,

Mrs. Ruth Atuman
+2348034638877

Appendix T: Letter of permission for research assistants training and pilot study

Behind Metro Clinic
Off Goodluck Jonathan Street
Federal Lowcost Gombe
Gombe State.
7th July, 2014.

The Principal
Government Day Secondary School Zambuk
Yamaltu Deba Local Government Area
Gombe State.

Dear Sir,

REQUEST FOR PERMISSION TO CONDUCT RESEARCH ASSISTANTS' TRAINING

I am a student from Newcastle University United Kingdom, doing my research on the topic "Orthography vs. phonological representation: L2 English production and perception by L1 Tera speakers". I will be collecting my data in Government Junior secondary schools Difa and Zambuk. In order to do so, I will require to train research assistants who will help me with the data collection. I have asked 2 of your staff in persons of Mrs. Ruth Atuman and Mr. Hassan Mahdi to be my assistants and they have agreed to do it. I therefore request to use facilities in your school to train them for this task. The whole activities will be done within 8 working days.

I will be glad if my request is granted.

Yours sincerely,

Rebecca Ishaku Musa
08066053799

GOVT. DAY SEC. SCHOOL
DATE 07-07-014
ZAMBUK

Permission granted.

Appendix U: Research assistants' declaration of confidentiality

DELCARATION REGARDING SUBJECT AND DATA CONFIDENTIALITY FOR PEOPLE WITH ACCESS TO STUDY DATA

Title of study: Orthography vs Phonological representation: L2 English production and perception by L1 Tera speakers.

You are being given access to the study data for the sole reason of your being a research assistant in the study. The recordings, sound files and all other paper documents in this study are confidential and access is provided to you on confidential basis.

Declaration: I hereby declare that:

1. I will not disclose any information concerning any participant or the content of any recording to any person who is not carrying out the research together with me.
2. I will use the recording only for the purpose provided and I will not copy any of the material for my own use
3. I understand that all subject are to remain anonymous
4. If I recognize a speaker on the database, I will not discuss their recording with them, nor identify them to any other person.

Name of assistant research (AR) HASSAN MAHBI

Signature of AR

Date declaration was signed 05/03/015

One copy of this document will be left with you. A second copy will be filed by Rebecca Ishaku Musa, the main researcher of the study.

DELCARATION REGARDING SUBJECT AND DATA CONFIDENTIALITY FOR PEOPLE WITH ACCESS TO STUDY DATA

Title of study: Orthography vs Phonological representation: L2 English production and perception by L1 Tera speakers.

You are being given access to the study data for the sole reason of your being a research assistant in the study. The recordings, sound files and all other paper documents in this study are confidential and access is provided to you on confidential basis.

Declaration: I hereby declare that:

1. I will not disclose any information concerning any participant or the content of any recording to any person who is not carrying out the research together with me.
2. I will use the recording only for the purpose provided and I will not copy any of the material for my own use
3. I understand that all subject are to remain anonymous
4. If I recognize a speaker on the database, I will not discuss their recording with them, nor identify them to any other person.

Name of assistant research (AR) RUTH ATUMAN

Signature of AR [signature]

Date declaration was signed 05/03/15

One copy of this document will be left with you. A second copy will be filed by Rebecca Ishaku Musa, the main researcher of the study.

Appendix V: Research assitants confirmation of ownership

Confirmation of Ownership and Rights of Data

We, **Mr Hassan Mahdi** and **Mrs Ruth Atuman** of Government Day Secondary School Zambuk, Yamaltu Deba L.G.A. Gombe state, hereby declare and confirm the following:

1. That we were trained as research assistants by Mrs Rebecca Ishaku Musa in July, 2014 to help with the collection of her data on her behalf in Government Junior Secondary Schools in Zambuk and Difa, Yamaltu Deba L.G.A. Gombe state.
2. That we have declared and signed the subject and data confidentiality for having access to the data of the study.
3. That we undertook the data collection on her behalf from January to March 2015
4. That all the materials used for the data collection has been sent to her by post through DHL and a copy kept in a pass worded flash drive with the principal of Government Junior Secondary School Zambuk in a locked cabinet in the principal's office
5. **That full ownership and rights of the data belong to Mrs Rebecca Ishaku Musa.**

Name of research assistant 1 HASSAN MAHDI

Signature

Date 05/03/015

Name of research assistant 2 RUTH ATUMAN

Signature

Date 05/03/15

Appendix W: Research assitants training report

Report of the Training of Local Research Assistants

Training

The training of the two local research assistants took place on 07/07/2014 at the computer room of Government Day Secondary School (GDSS) Zambuk between 09:00 – 11:30 AM. The two assistants, male and female adults between the ages of 30 – 35, were briefed on the background of the study and the roles they would be expected to play. Permission was sought from the principal of the school to conduct the training in the school and he happily approved it (see attachment for the permission). After having understood the task, the training began in earnest with the main researcher explaining the step-by-step of the methodology in detail which included the following:

- Participants' selection/recruitment 9:00 – 9:30
- Materials 9:30 – 10:00
- Procedure 10:00 – 11:00
- Questions 11:00 – 11:30

All grey areas during the training were clarified by the main researcher. Hand-outs of the research methodology were used for the training. The duration of the training was about 2 hours 30 minutes (9:00 to 11:30).

The information of the research assistants is as follows:

1. Mrs. Ruth Atuman
   Government Day Secondary School Zambuk
   Yamaltu Deba Local Government Area
   Gombe State.
   Qualification: B.A. English Language
   Position: Education Officer 2
2. Mr. Hassan Mahdi
   Government Day Secondary School Zambuk
   Yamaltu Deba Local Government Area
   Gombe State.
   Qualification: B.A. English Language
   Position: Education Officer 2

Security

The venue of the training was a school and it was well secured. It is fenced with high walls and a gate. There were security men guarding the school as is provided in all the schools in the state. (See attachment for letter from the Divisional Police Officer, Gombe Division.)

Practice

After the training session, the assistants were required to practice what they were trained to do. That is, they piloted the procedure. This was conducted in the following week after the training by the main researcher and the two research assistants in the computer room of GDSS Zambuk where they work as English language teachers. Nineteen Tera-speaking students between the ages of 13-17 were randomly selected and recruited from among the Senior Secondary School (SSS) 1 students. There was only one class of SSS 1 students and so the selection was done based on their native/first language being Tera, therefore students whose L1 was not Tera were not selected to participate. The practice lasted for 7 school days as follows:

Day 1 (11th July): Recruitment of participants, pre-briefing, participant consent form, which they read and signed, and placement test. (See Project Approval, including Ethics Approval.)

Day 2 (14th July): The pre-test was conducted by the two assistants.

Day 3 (15th July): The assistants randomly divided participants into three experimental groups and then began the intervention lessons with onset consonant clusters. The groups were taught one after the other. The main researcher first demonstrated this lesson and was observed by the assistants.

Day 4 (16th July): The second day of the lesson with coda consonant clusters was conducted by the two research assistants and observed by the main researcher.

Day 5 (17th July): The third day of the lessons with silent letters was conducted by the research assistants.

Day 6 (18th July): The fourth day of the lessons with consonant digraphs was conducted by the research assistants.

Day 7 (21st July): Post-test was conducted mainly by the research assistants and observed by the main researcher.

(See attachment for activity pictures.)

Debriefing

1. Daily debriefing of the research assistants was conducted by the main researcher after each session and any issues or mistakes observed during the session were addressed.
2. The participants were debriefed by the research assistants on the progress of the study at the end of the process and were given the debriefing sheet. In appreciation for their participation, they were each given two exercise books and a pen.
3. The principal of the school was debriefed on the progress of the study and acknowledged for the cooperation rendered. In response, the principal also voiced his appreciation to the researcher for conducting the training in the school, stating that it would be beneficial to the students and the trained teachers as well. He very highly supported the main testing.

Research assistants' consent

The research assistants gave a written consent letter of their participation as research assistants. (See attachment for their signed letters.)

The main researcher went along with the two research assistants to the two schools (Government Junior Secondary School Zambuk and Difa) where the main study will be conducted for introduction to the principals of the schools.

Observations during the pilot study

During the course of the pilot study the following were observed:

1. Environment: The environment was conducive to learning. The computer room was used and it was quiet as the other students not participating in the study were in their classes. This also offered an opportunity to conduct the two listening tests with the whole group at once instead of individually.
2. Tasks: Some of the pictures in the picture naming task were difficult for the participants to identify; therefore the picture naming task will be reviewed in the periods of September – December when the task for the data collection will be refined. (see revised project timeline below)
3. Timing: The timing was adequate for the tasks and intervention contact sessions. In fact, time was saved as a result of having combined listening tests.

Challenges

The major challenge was the lack of reliable electricity power supply which rendered the laptop unusable at some points. However, a means was improvised whereby flip chats of the print out of the Power Point slides were used. This challenge has suggested a way of dealing with this situation during the main study by means of using flip chats instead of Power Point presentation.

Action Plan

The data collected during the training of the assistants in form of the pilot study will be analysed by the main researcher in the period of September to December to make necessary changes to the tasks where the results of the pilot study requires doing so. Afterwards, the coda drafts of the tasks and all other materials needed for the data collection (e.g. flash drives and digital recorders) will be sent to the research assistants by DHL. The main study will commence for the assistants and participants in the month of January 2015, being the second term of the academic year when the students would have resumed school after the Christmas break. Although it is worth mentioning that since the research assistants are ready for the exercise, subject to the prompt refining of the task for the data collection by the main researcher; there could be an opportunity to collect the data earlier than the projected time of January 2015; probably in the period of October to December.

The research assistants' main duties will consist of the following:

1. Conducting participant recruitment
2. Distributing and collecting information and consent forms
3. Putting students into three experimental groups
4. Providing the treatment
5. Conducting pre-tests and post-tests
6. Distributing debriefing forms
7. Backing up of the data by photocopying and electronic copying of data and research documents in memory stick.
8. Handling, packaging and sending the data and all other research documents by DHL.

Appendix X: Pilot study tables, and figures

Appendix X.1: Repeated measures ANOVA results on the Epenthesis task

Source		F	Sig.	Partial Eta Squared
Pre-test & post-test epenthesis	Sphericity Assumed	6.350	.024	.297
	Greenhouse-Geisser	6.350	.024	.297
	Huynh-Feldt	6.350	.024	.297
	Lower-bound	6.350	.024	.297
Pre-test & post-test epenthesis * Group	Sphericity Assumed	3.310	.064	.306
	Greenhouse-Geisser	3.310	.064	.306
	Huynh-Feldt	3.310	.064	.306
	Lower-bound	3.310	.064	.306

Appendix X.2: Repeated measures ANOVA results on the Dictation task

Source		F	Sig.	Partial Eta Squared
Pre-test & post-test dictation	Sphericity Assumed	49.345	.000	.767
	Greenhouse-Geisser	49.345	.000	.767
	Huynh-Feldt	49.345	.000	.767
	Lower-bound	49.345	.000	.767
Pre-test & post-test dictation * Group	Sphericity Assumed	4.084	.038	.353
	Greenhouse-Geisser	4.084	.038	.353
	Huynh-Feldt	4.084	.038	.353
	Lower-bound	4.084	.038	.353

Appendix X.3: Repeated measures ANOVA results on the Picture-naming task

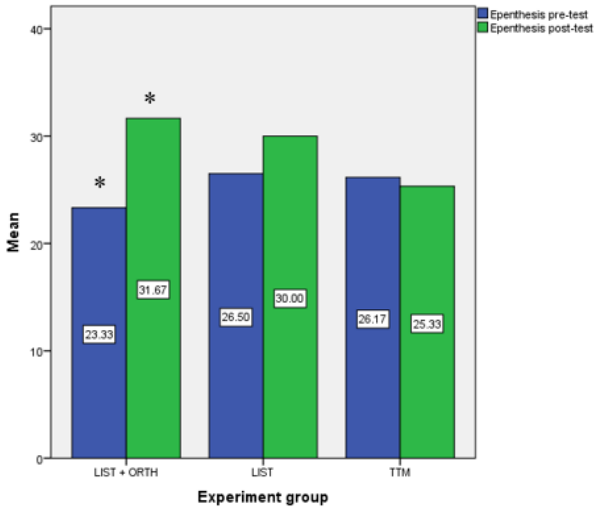
Source		F	Sig.	Partial Eta Squared
Pre-test & post-test picture-naming	Sphericity Assumed	67.301	.000	.818
	Greenhouse-Geisser	67.301	.000	.818
	Huynh-Feldt	67.301	.000	.818
	Lower-bound	67.301	.000	.818
Pre-test & post-test picture-naming * Group	Sphericity Assumed	1.637	.227	.179
	Greenhouse-Geisser	1.637	.227	.179
	Huynh-Feldt	1.637	.227	.179
	Lower-bound	1.637	.227	.179

Appendix X.4: Repeated measures ANOVA results on the Reading aloud task

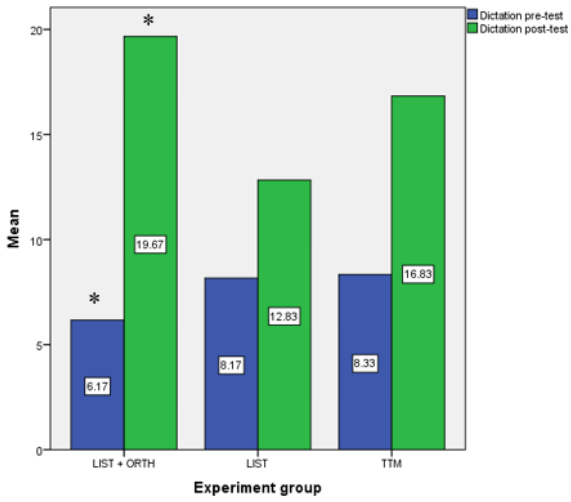
Source		F	Sig.	Partial Eta Squared
Pre-test & post-test reading	Sphericity Assumed	26.697	.000	.640
	Greenhouse-Geisser	26.697	.000	.640
	Huynh-Feldt	26.697	.000	.640
	Lower-bound	26.697	.000	.640
Pre-test & post-test reading * Group	Sphericity Assumed	1.495	.256	.166
	Greenhouse-Geisser	1.495	.256	.166
	Huynh-Feldt	1.495	.256	.166
	Lower-bound	1.495	.256	.166

Appendix X.5: Pilot study mean scores Figures

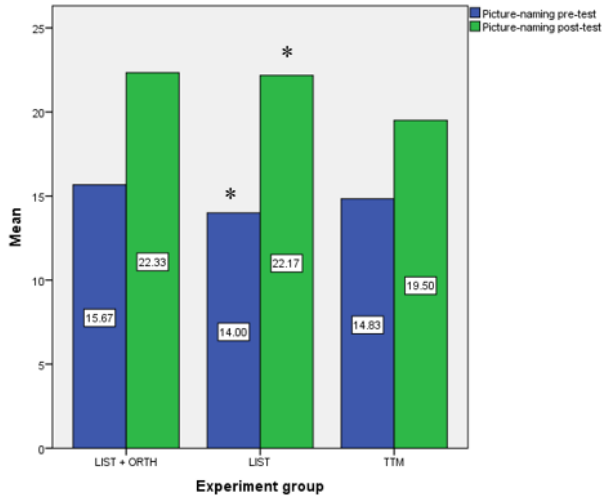
Appendix X.5.1 Epenthesis



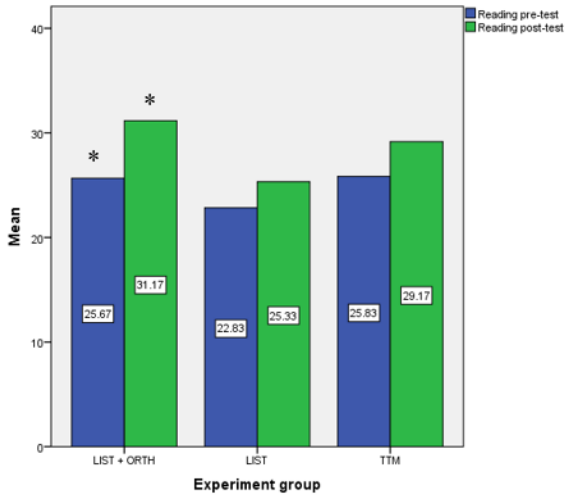
Appendix X.5.2 Dictation



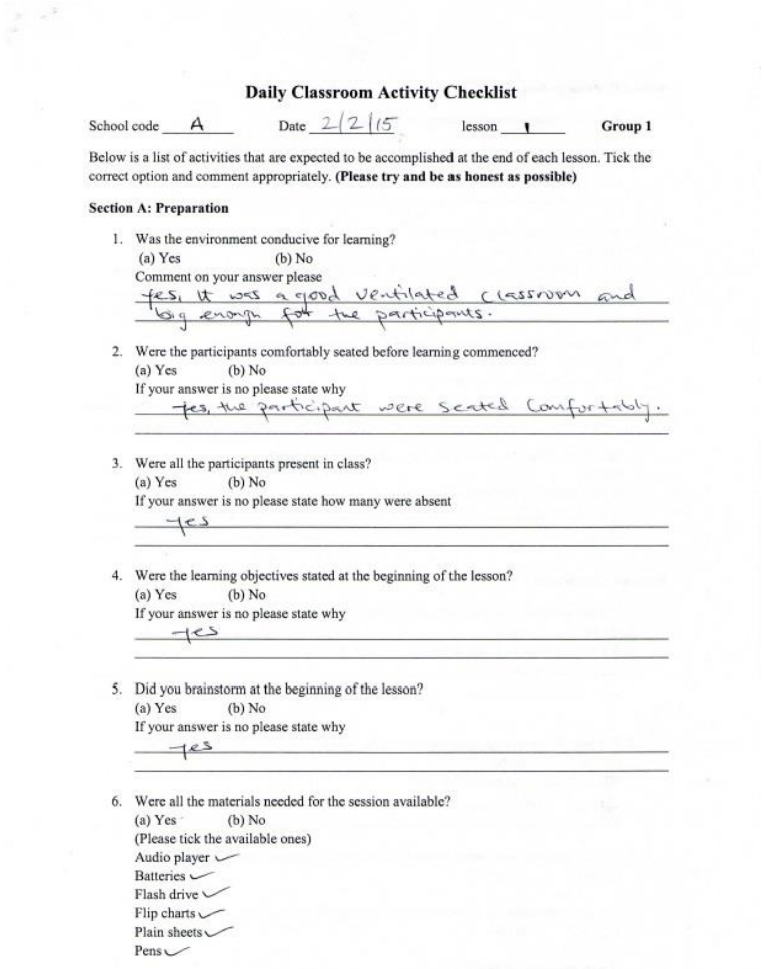
Appendix X.5.3 Picture-naming



Appendix X.5.4 Reading



Appendix Y: Daily classroom activity checklist



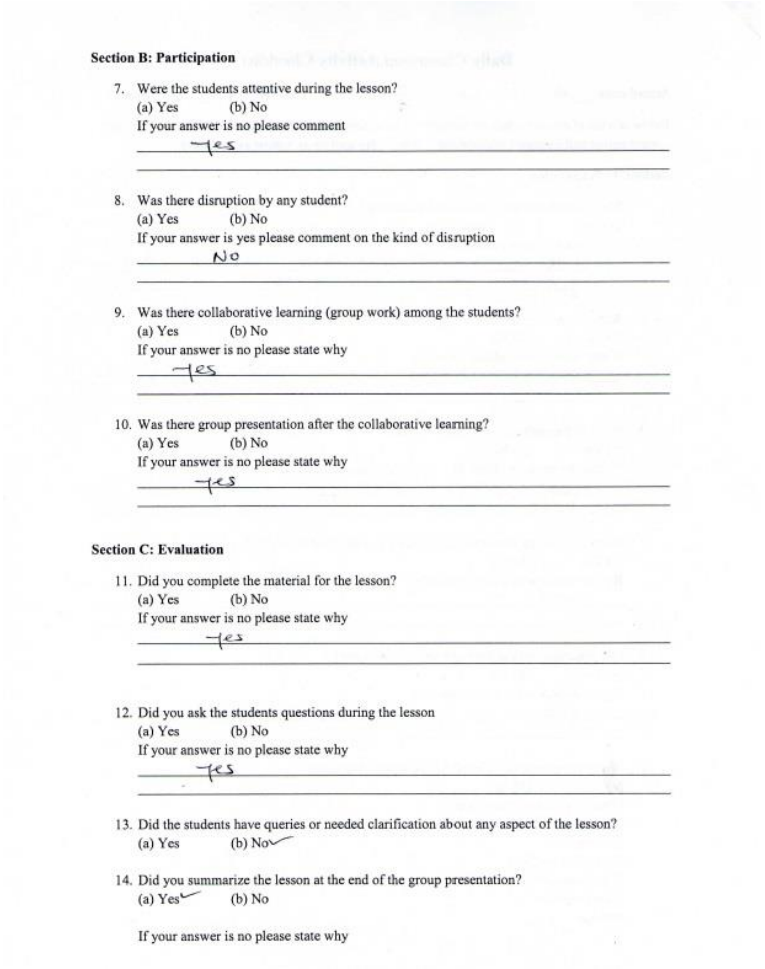
Daily Classroom Activity Checklist

School code A Date 2/2/15 lesson 1 **Group 1**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes (b) No
   Comment on your answer please
   yes, it was a good ventilated classroom and big enough for the participants.
2. Were the participants comfortably seated before learning commenced?
   (a) Yes (b) No
   If your answer is no please state why
   yes, the participant were seated comfortably.
3. Were all the participants present in class?
   (a) Yes (b) No
   If your answer is no please state how many were absent
   yes
4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   yes
5. Did you brainstorm at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   yes
6. Were all the materials needed for the session available?
   (a) Yes (b) No
   (Please tick the available ones)
   Audio player ✓
   Batteries ✓
   Flash drive ✓
   Flip charts ✓
   Plain sheets ✓
   Pens ✓



Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes (b) No
   If your answer is no please comment
   yes
8. Was there disruption by any student?
   (a) Yes (b) No
   If your answer is yes please comment on the kind of disruption
   No
9. Was there collaborative learning (group work) among the students?
   (a) Yes (b) No
   If your answer is no please state why
   yes
10. Was there group presentation after the collaborative learning?
    (a) Yes (b) No
    If your answer is no please state why
    yes

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes (b) No
    If your answer is no please state why
    yes
12. Did you ask the students questions during the lesson
    (a) Yes (b) No
    If your answer is no please state why
    yes
13. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes (b) No ✓
14. Did you summarize the lesson at the end of the group presentation?
    (a) Yes ✓ (b) No

    If your answer is no please state why

Yes

15. Did you comment or correct any errors made by the students in the collaborative learning activities?
(a) Yes (b) No
If your answer is no please state why
Yes

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

The good practice we did was Identifying words with two initial Consonant Clusters and we practice to pronounce the words correctly.

Daily Classroom Activity Checklist

School code A Date 2/2/15 lesson 1 **Group 2**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
(a) Yes (b) No
Comment on your answer please
Yes, A big classroom to accomodate the participants and is well ventilated.

2. Were the participants comfortably seated before learning commenced?
(a) Yes (b) No
If your answer is no please state why
Yes

3. Were all the participants present in class?
(a) Yes (b) No
If your answer is no please state how many were absent
Yes

4. Were the learning objectives stated at the beginning of the lesson?
(a) Yes (b) No
If your answer is no please state why
Yes

5. Did you brainstorm at the beginning of the lesson?
(a) Yes (b) No
If your answer is no please state why
Yes

6. Were all the materials needed for the session available?
(a) Yes (b) No
(Please tick the available ones)
Audio player ✓
Batteries ✓
Flash drive ✓
Plain sheets ✓
Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes (b) No
   If your answer is no please comment
   Yes

8. Was there disruption by any student?
   (a) Yes (b) No
   If your answer is yes please comment on the kind of disruption
   No

9. Was there collaborative learning (group work) among the students?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

10. Was there group presentation after the collaborative learning?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

12. Did you ask the students questions during the lesson
    (a) Yes (b) No
    If your answer is no please state why
    Yes

13. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes (b) No✓

14. Did you summarize the lesson at the end of the group presentation?
    (a) Yes✓ (b) No

    If your answer is no please state why

14. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes✓ (b) No

15. Did you summarize the lesson at the end of the group presentation?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

16. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

The good practice was learning to pronounce the words correctly

Daily Classroom Activity Checklist

School code A Date 2/2/15 lesson 1 **Group 3**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. Please try and be as honest as possible.

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes (b) No
   Comment on your answer please
   Yes, the classroom is well ventilated and big enough for the participants.

2. Were the participants comfortably seated before learning commenced?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

3. Were all the participants present in class?
   (a) Yes (b) No
   If your answer is no please state how many were absent
   One was absent

4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

5. Did you brainstorm at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

6. Were all the materials needed for the session available?
   (a) Yes (b) No
   (Please tick the available ones)
   Lesson note ✓
   Chalk ✓
   Chalkboard duster ✓
   Plain sheets ✓
   Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

8. Was there disruption by any student?
   (a) Yes (b) No
   If your answer is yes please comment on the kind of disruption
   No

9. Was there collaborative learning (group work) among the students?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

10. Was there group presentation after the collaborative learning?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

Section C: Evaluation

11. Did you ask the students questions during the lesson
    (a) Yes (b) No
    If your answer is no please state why
    Yes

12. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes (b) No ✓

13. Did you summarize the lesson at the end of the group presentation?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

14. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

learning to pronounce the words correctly.

Daily Classroom Activity Checklist

School code A Date 4/2/15 lesson 2 **Group 1**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes (b) No
   Comment on your answer please
   Yes, we had a good ventilated classroom that is conducive for learning.

2. Were the participants comfortably seated before learning commenced?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

3. Were all the participants present in class?
   (a) Yes (b) No
   If your answer is no please state how many were absent
   Yes

4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

5. Did you brainstorm at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

6. Were all the materials needed for the session available?
   (a) Yes (b) No
   (Please tick the available ones)
   Audio player ✓
   Batteries ✓
   Flash drive ✓
   Flip charts ✓
   Plain sheets ✓
   Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes (b) No
   If your answer is no please comment
   yes

8. Was there disruption by any student?
   (a) Yes (b) No
   If your answer is yes please comment on the kind of disruption
   NO

9. Was there collaborative learning (group work) among the students?
   (a) Yes (b) No
   If your answer is no please state why
   yes

10. Was there group presentation after the collaborative learning?
    (a) Yes (b) No
    If your answer is no please state why
    yes

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes (b) No
    If your answer is no please state why
    yes

12. Did you ask the students questions during the lesson
    (a) Yes (b) No
    If your answer is no please state why
    yes

13. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes (b) No

14. Did you summarize the lesson at the end of the group presentation?
    (a) Yes (b) No

    If your answer is no please state why
    yes

15. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes (b) No
    If your answer is no please state why
    yes

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

The participants learn how to pronounce the words correctly

Daily Classroom Activity Checklist

School code A Date 4/2/15 lesson 2 **Group 2**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes (b) No
   Comment on your answer please
   Yes, the classroom is big enough and well ventilated.

2. Were the participants comfortably seated before learning commenced?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

3. Were all the participants present in class?
   (a) Yes (b) No
   If your answer is no please state how many were absent
   No, two were absent

4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

5. Did you brainstorm at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

6. Were all the materials needed for the session available?
   (a) Yes (b) No
   (Please tick the available ones)
   Audio player ✓
   Batteries ✓
   Flash drive ✓
   Plain sheets ✓
   Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes (b) No
   If your answer is no please comment
   Yes

8. Was there disruption by any student?
   (a) Yes (b) No
   If your answer is yes please comment on the kind of disruption
   No

9. Was there collaborative learning (group work) among the students?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

10. Was there group presentation after the collaborative learning?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

12. Was any written material seen in the class?
    (a) Yes (b) No
    If your answer is yes please state what kind of written material
    Plain sheet and pens

13. Did you ask the students questions during the lesson
    (a) Yes (b) No
    If your answer is no please state why
    Yes

14. Did the students have queries or needed clarification about any aspect of the lesson?
(a) Yes (b) No ✓

15. Did you summarize the lesson at the end of the group presentation?
(a) Yes (b) No
If your answer is no please state why
yes

16. Did you comment or correct any errors made by the students in the collaborative learning activities?
(a) Yes (b) No
If your answer is no please state why
yes

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

The participants learn how to pronounce the words correctly

Daily Classroom Activity Checklist

School code A Date 4/2/15 lesson 2 **Group 3**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. Please try and be as honest as possible.

Section A: Preparation

1. Was the environment conducive for learning?
(a) Yes (b) No
Comment on your answer please
yes, the classroom is well ventilated and conducive for learning.

2. Were the participants comfortably seated before learning commenced?
(a) Yes (b) No
If your answer is no please state why
yes

3. Were all the participants present in class?
(a) Yes (b) No
If your answer is no please state how many were absent
yes

4. Were the learning objectives stated at the beginning of the lesson?
(a) Yes (b) No
If your answer is no please state why
yes

5. Did you brainstorm at the beginning of the lesson?
(a) Yes (b) No
If your answer is no please state why
yes

6. Were all the materials needed for the session available?
(a) Yes (b) No
(Please tick the available ones)
Lesson note
Chalk ✓
Chalkboard duster ✓
Plain sheets ✓
Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

8. Was there disruption by any student?
   (a) Yes (b) No
   If your answer is yes please comment on the kind of disruption
   No

9. Was there collaborative learning (group work) among the students?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

10. Was there group presentation after the collaborative learning?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

Section C: Evaluation

11. Did you ask the students questions during the lesson
    (a) Yes (b) No
    If your answer is no please state why
    Yes

12. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes (b) No

13. Did you summarize the lesson at the end of the group presentation?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

14. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

The participants learn how to pronounce the words correctly.

Daily Classroom Activity Checklist

School code A Date 9/2/15 lesson 3 **Group 1**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes (b) No
   Comment on your answer please
   yes, the classroom was big enough and well ventilated

2. Were the participants comfortably seated before learning commenced?
   (a) Yes (b) No
   If your answer is no please state why
   yes

3. Were all the participants present in class?
   (a) Yes (b) No
   If your answer is no please state how many were absent
   yes

4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   yes

5. Did you brainstorm at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   yes

6. Were all the materials needed for the session available?
   (a) Yes (b) No
   (Please tick the available ones)
   Audio player ✓
   Batteries ✓
   Flash drive ✓
   Flip charts ✓
   Plain sheets ✓
   Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes (b) No
   If your answer is no please comment
   yes

8. Was there disruption by any student?
   (a) Yes (b) No
   If your answer is yes please comment on the kind of disruption
   NO

9. Was there collaborative learning (group work) among the students?
   (a) Yes (b) No
   If your answer is no please state why
   yes

10. Was there group presentation after the collaborative learning?
    (a) Yes (b) No
    If your answer is no please state why
    yes

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes (b) No
    If your answer is no please state why
    yes

12. Did you ask the students questions during the lesson
    (a) Yes (b) No
    If your answer is no please state why
    yes

13. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes (b) No ✓

14. Did you summarize the lesson at the end of the group presentation?
    (a) Yes ✓ (b) No

    If your answer is no please state why

yes

15. Did you comment or correct any errors made by the students in the collaborative learning activities?
(a) Yes (b) No
If your answer is no please state why
yes

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

We did good practice of spelling the words and to pronounce them Correctly.

Daily Classroom Activity Checklist

School code A Date 9/2/15 lesson 3 **Group 2**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
(a) Yes (b) No
Comment on your answer please
yes, the classroom is well ventilated and conducive for learning

2. Were the participants comfortably seated before learning commenced?
(a) Yes (b) No
If your answer is no please state why
yes

3. Were all the participants present in class?
(a) Yes (b) No
If your answer is no please state how many were absent
No, three were absent

4. Were the learning objectives stated at the beginning of the lesson?
(a) Yes (b) No
If your answer is no please state why
yes

5. Did you brainstorm at the beginning of the lesson?
(a) Yes (b) No
If your answer is no please state why
yes

6. Were all the materials needed for the session available?
(a) Yes (b) No
(Please tick the available ones)
Audio player ✓
Batteries ✓
Flash drive ✓
Plain sheets ✓
Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes (b) No
   If your answer is no please comment
   yes

8. Was there disruption by any student?
   (a) Yes (b) No
   If your answer is yes please comment on the kind of disruption
   NO

9. Was there collaborative learning (group work) among the students?
   (a) Yes (b) No
   If your answer is no please state why
   yes

10. Was there group presentation after the collaborative learning?
    (a) Yes (b) No
    If your answer is no please state why
    yes

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes (b) No
    If your answer is no please state why
    yes

12. Was any written material seen in the class?

    (a) Yes (b) No
    If your answer is yes please state what kind of written material
    NO

13. Did you ask the students questions during the lesson
    (a) Yes (b) No
    If your answer is no please state why
    yes

14. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes (b) No

15. Did you summarize the lesson at the end of the group presentation?
    (a) Yes (b) No
    If your answer is no please state why
    yes

16. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes (b) No
    If your answer is no please state why
    yes

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

The good practice we did, is to pronounce the words correctly.

Daily Classroom Activity Checklist

School code A Date 9/2/15 lesson 3 **Group 3**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. Please try and be as honest as possible.

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes (b) No
   Comment on your answer please
   yes, the classroom is well ventilated and conducive for learning

2. Were the participants comfortably seated before learning commenced?
   (a) Yes (b) No
   If your answer is no please state why
   yes

3. Were all the participants present in class?
   (a) Yes (b) No
   If your answer is no please state how many were absent
   No one was absent

4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   yes

5. Did you brainstorm at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   yes

6. Were all the materials needed for the session available?
   (a) Yes (b) No
   (Please tick the available ones)
   Lesson note ✓
   Chalk ✓
   Chalkboard duster ✓
   Plain sheets ✓
   Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   yes

8. Was there disruption by any student?
   (a) Yes (b) No
   If your answer is yes please comment on the kind of disruption
   No

9. Was there collaborative learning (group work) among the students?
   (a) Yes (b) No
   If your answer is no please state why
   yes

10. Was there group presentation after the collaborative learning?
    (a) Yes (b) No
    If your answer is no please state why
    yes

Section C: Evaluation

11. Did you ask the students questions during the lesson
    (a) Yes (b) No
    If your answer is no please state why
    yes

12. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes (b) No ✓

13. Did you summarize the lesson at the end of the group presentation?
    (a) Yes (b) No
    If your answer is no please state why
    yes

14. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes (b) No
    If your answer is no please state why
    yes

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

The participants repeat the words after me and pronounce them correctly.

Daily Classroom Activity Checklist

School code A Date 11/2/15 lesson 4 **Group 1**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes (b) No
   Comment on your answer please
   yes, the environment was conducive for learning
2. Were the participants comfortably seated before learning commenced?
   (a) Yes (b) No
   If your answer is no please state why
   yes
3. Were all the participants present in class?
   (a) Yes (b) No
   If your answer is no please state how many were absent
   No one is absent
4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   yes
5. Did you brainstorm at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   yes
6. Were all the materials needed for the session available?
   (a) Yes (b) No
   (Please tick the available ones)
   Audio player ✓
   Batteries ✓
   Flash drive ✓
   Flip charts ✓
   Plain sheets ✓
   Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes (b) No
   If your answer is no please comment
   yes

8. Was there disruption by any student?
   (a) Yes (b) No
   If your answer is yes please comment on the kind of disruption
   No

9. Was there collaborative learning (group work) among the students?
   (a) Yes (b) No
   If your answer is no please state why
   yes

10. Was there group presentation after the collaborative learning?
    (a) Yes (b) No
    If your answer is no please state why
    yes

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes (b) No
    If your answer is no please state why
    yes

12. Did you ask the students questions during the lesson
    (a) Yes (b) No
    If your answer is no please state why
    yes

13. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes (b) No

14. Did you summarize the lesson at the end of the group presentation?
    (a) Yes (b) No

    If your answer is no please state why
    yes

15. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes (b) No
    If your answer is no please state why
    yes

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

we practice the spelling of the words with three final cluster and pronounce them correctly.

Daily Classroom Activity Checklist

School code A Date 11/2/15 lesson 4 **Group 2**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes (b) No
   Comment on your answer please
   Yes, it was conducive

2. Were the participants comfortably seated before learning commenced?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

3. Were all the participants present in class?
   (a) Yes (b) No
   If your answer is no please state how many were absent
   No, three were absent

4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

5. Did you brainstorm at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

6. Were all the materials needed for the session available?
   (a) Yes (b) No
   (Please tick the available ones)
   Audio player ✓
   Batteries ✓
   Flash drive ✓
   Plain sheets ✓
   Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes (b) No
   If your answer is no please comment
   Yes

8. Was there disruption by any student?
   (a) Yes (b) No
   If your answer is yes please comment on the kind of disruption
   No

9. Was there collaborative learning (group work) among the students?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

10. Was there group presentation after the collaborative learning?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

12. Was any written material seen in the class?
    (a) Yes (b) No
    If your answer is yes please state what kind of written material
    No

13. Did you ask the students questions during the lesson
    (a) Yes (b) No
    If your answer is no please state why
    Yes

14. Did the students have queries or needed clarification about any aspect of the lesson?
(a) Yes (b) No ✓

15. Did you summarize the lesson at the end of the group presentation?
(a) Yes (b) No
If your answer is no please state why
yes

16. Did you comment or correct any errors made by the students in the collaborative learning activities?
(a) Yes (b) No
If your answer is no please state why
yes

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

we practice how to pronounce the words correctly

Daily Classroom Activity Checklist

School code A Date 11/2/15 lesson 4 **Group 3**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. Please try and be as honest as possible.

Section A: Preparation

1. Was the environment conducive for learning?
(a) Yes (b) No
Comment on your answer please
yes, it was conducive

2. Were the participants comfortably seated before learning commenced?
(a) Yes (b) No
If your answer is no please state why
yes

3. Were all the participants present in class?
(a) Yes (b) No
If your answer is no please state how many were absent
No one was absent

4. Were the learning objectives stated at the beginning of the lesson?
(a) Yes (b) No
If your answer is no please state why
yes

5. Did you brainstorm at the beginning of the lesson?
(a) Yes (b) No
If your answer is no please state why
yes

6. Were all the materials needed for the session available?
(a) Yes (b) No
(Please tick the available ones)
Lesson note ✓
Chalk ✓
Chalkboard duster ✓
Plain sheets ✓
Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

8. Was there disruption by any student?
   (a) Yes (b) No
   If your answer is yes please comment on the kind of disruption
   No

9. Was there collaborative learning (group work) among the students?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

10. Was there group presentation after the collaborative learning?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

Section C: Evaluation

11. Did you ask the students questions during the lesson
    (a) Yes (b) No
    If your answer is no please state why
    Yes

12. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes (b) No ✓

13. Did you summarize the lesson at the end of the group presentation?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

14. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

The participants repeat the words after me on the blackboard and they learn how to spell the words correctly.

Daily Classroom Activity Checklist

School code A Date 16/2/15 lesson 5 **Group 1**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes (b) No
   Comment on your answer please
   yes, the classroom ~~was~~ is big and well ventilated for learning.

2. Were the participants comfortably seated before learning commenced?
   (a) Yes (b) No
   If your answer is no please state why
   yes

3. Were all the participants present in class?
   (a) Yes (b) No
   If your answer is no please state how many were absent
   yes

4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   yes

5. Did you brainstorm at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   yes

6. Were all the materials needed for the session available?
   (a) Yes (b) No
   (Please tick the available ones)
   Audio player✓
   Batteries✓
   Flash drive✓
   Flip charts✓
   Plain sheets✓
   Pens✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes (b) No
   If your answer is no please comment
   yes

8. Was there disruption by any student?
   (a) Yes (b) No
   If your answer is yes please comment on the kind of disruption
   No

9. Was there collaborative learning (group work) among the students?
   (a) Yes (b) No
   If your answer is no please state why
   yes

10. Was there group presentation after the collaborative learning?
    (a) Yes (b) No
    If your answer is no please state why
    yes

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes (b) No
    If your answer is no please state why
    yes

12. Did you ask the students questions during the lesson
    (a) Yes (b) No
    If your answer is no please state why
    yes

13. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes (b) No✓

14. Did you summarize the lesson at the end of the group presentation?
    (a) Yes (b) No

    If your answer is no please state why

yes

15. Did you comment or correct any errors made by the students in the collaborative learning activities?
(a) Yes (b) No
If your answer is no please state why
yes

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

we practice how to pronounce the words with initial silent letter

Daily Classroom Activity Checklist

School code A Date 16/2/15 lesson 5 **Group 2**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
(a) Yes (b) No
Comment on your answer please
yes, it was conducive for learning

2. Were the participants comfortably seated before learning commenced?
(a) Yes (b) No
If your answer is no please state why
yes

3. Were all the participants present in class?
(a) Yes (b) No
If your answer is no please state how many were absent
yes

4. Were the learning objectives stated at the beginning of the lesson?
(a) Yes (b) No
If your answer is no please state why
yes

5. Did you brainstorm at the beginning of the lesson?
(a) Yes (b) No
If your answer is no please state why
yes

6. Were all the materials needed for the session available?
(a) Yes (b) No
(Please tick the available ones)
Audio player ✓
Batteries ✓
Flash drive ✓
Plain sheets ✓
Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes (b) No
   If your answer is no please comment
   yes

8. Was there disruption by any student?
   (a) Yes (b) No
   If your answer is yes please comment on the kind of disruption
   No

9. Was there collaborative learning (group work) among the students?
   (a) Yes (b) No
   If your answer is no please state why
   yes

10. Was there group presentation after the collaborative learning?
    (a) Yes (b) No
    If your answer is no please state why
    yes

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes (b) No
    If your answer is no please state why
    yes

12. Was any written material seen in the class?

    (a) Yes (b) No
    If your answer is yes please state what kind of written material
    No

13. Did you ask the students questions during the lesson
    (a) Yes (b) No
    If your answer is no please state why
    yes

14. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes (b) No

15. Did you summarize the lesson at the end of the group presentation?
    (a) Yes (b) No
    If your answer is no please state why
    yes

16. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes (b) No
    If your answer is no please state why
    yes

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

we practice how to pronounce the words with initial final letter

Daily Classroom Activity Checklist

School code A Date 16/2/15 lesson 5 **Group 3**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. Please try and be as honest as possible.

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes (b) No
   Comment on your answer please
   yes, it was conducive

2. Were the participants comfortably seated before learning commenced?
   (a) Yes (b) No
   If your answer is no please state why
   yes

3. Were all the participants present in class?
   (a) Yes (b) No
   If your answer is no please state how many were absent
   yes

4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   yes

5. Did you brainstorm at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   yes

6. Were all the materials needed for the session available?
   (a) Yes (b) No
   (Please tick the available ones)
   Lesson note ✓
   Chalk ✓
   Chalkboard duster ✓
   Plain sheets ✓
   Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   yes

8. Was there disruption by any student?
   (a) Yes (b) No
   If your answer is yes please comment on the kind of disruption
   No

9. Was there collaborative learning (group work) among the students?
   (a) Yes (b) No
   If your answer is no please state why
   yes

10. Was there group presentation after the collaborative learning?
    (a) Yes (b) No
    If your answer is no please state why
    yes

Section C: Evaluation

11. Did you ask the students questions during the lesson
    (a) Yes (b) No
    If your answer is no please state why
    yes

12. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes ✓ (b) No

13. Did you summarize the lesson at the end of the group presentation?
    (a) Yes (b) No
    If your answer is no please state why
    yes

14. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes (b) No
    If your answer is no please state why
    yes

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

The errors made by the participants were Corrected and well pronounced and spelt

Daily Classroom Activity Checklist

School code A Date 18/2/15 lesson 6 **Group 1**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes (b) No
   Comment on your answer please
   Yes, the classroom is well ventilated and Conducive for learning.

2. Were the participants comfortably seated before learning commenced?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

3. Were all the participants present in class?
   (a) Yes (b) No
   If your answer is no please state how many were absent
   Yes

4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

5. Did you brainstorm at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

6. Were all the materials needed for the session available?
   (a) Yes (b) No
   (Please tick the available ones)
   Audio player ✓
   Batteries ✓
   Flash drive ✓
   Flip charts ✓
   Plain sheets ✓
   Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes (b) No
   If your answer is no please comment
   Yes

8. Was there disruption by any student?
   (a) Yes (b) No
   If your answer is yes please comment on the kind of disruption
   No

9. Was there collaborative learning (group work) among the students?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

10. Was there group presentation after the collaborative learning?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

12. Did you ask the students questions during the lesson
    (a) Yes (b) No
    If your answer is no please state why
    Yes

13. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes (b) No

14. Did you summarize the lesson at the end of the group presentation?
    (a) Yes (b) No

    If your answer is no please state why
    Yes

15. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

The words with medial and final Silent letter were spelt and pronounce Correctly

Daily Classroom Activity Checklist

School code A Date 18/2/15 lesson 6 **Group 2**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes (b) No
   Comment on your answer please
   Yes, it was conducive

2. Were the participants comfortably seated before learning commenced?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

3. Were all the participants present in class?
   (a) Yes (b) No
   If your answer is no please state how many were absent
   Yes

4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

5. Did you brainstorm at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

6. Were all the materials needed for the session available?
   (a) Yes (b) No
   (Please tick the available ones)
   Audio player✓
   Batteries✓
   Flash drive✓
   Plain sheets✓
   Pens✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes (b) No
   If your answer is no please comment
   Yes

8. Was there disruption by any student?
   (a) Yes (b) No
   If your answer is yes please comment on the kind of disruption
   NO

9. Was there collaborative learning (group work) among the students?
   (a) Yes (b) No
   If your answer is no please state why

10. Was there group presentation after the collaborative learning?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

12. Was any written material seen in the class?
    (a) Yes (b) No
    If your answer is yes please state what kind of written material
    NO

13. Did you ask the students questions during the lesson
    (a) Yes (b) No
    If your answer is no please state why
    Yes

14. Did the students have queries or needed clarification about any aspect of the lesson?
(a) Yes (b) No

15. Did you summarize the lesson at the end of the group presentation?
(a) Yes (b) No
If your answer is no please state why
yes

16. Did you comment or correct any errors made by the students in the collaborative learning activities?
(a) Yes (b) No
If your answer is no please state why
yes

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

We practice to pronounce the words with medial and final silent letters correctly

Daily Classroom Activity Checklist

School code A Date 18/2/15 lesson 6 **Group 3**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. Please try and be as honest as possible.

Section A: Preparation

1. Was the environment conducive for learning?
(a) Yes (b) No
Comment on your answer please
yes it was conducive

2. Were the participants comfortably seated before learning commenced?
(a) Yes (b) No
If your answer is no please state why
yes

3. Were all the participants present in class?
(a) Yes (b) No
If your answer is no please state how many were absent
yes

4. Were the learning objectives stated at the beginning of the lesson?
(a) Yes (b) No
If your answer is no please state why
yes

5. Did you brainstorm at the beginning of the lesson?
(a) Yes (b) No
If your answer is no please state why
yes

6. Were all the materials needed for the session available?
(a) Yes (b) No
(Please tick the available ones)
Lesson note ✓
Chalk ✓
Chalkboard duster ✓
Plain sheets ✓
Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   yes

8. Was there disruption by any student?
   (a) Yes (b) No
   If your answer is yes please comment on the kind of disruption
   No

9. Was there collaborative learning (group work) among the students?
   (a) Yes (b) No
   If your answer is no please state why
   yes

10. Was there group presentation after the collaborative learning?
    (a) Yes (b) No
    If your answer is no please state why
    yes

Section C: Evaluation

11. Did you ask the students questions during the lesson
    (a) Yes (b) No
    If your answer is no please state why
    yes

12. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes✓ (b) No

13. Did you summarize the lesson at the end of the group presentation?
    (a) Yes (b) No
    If your answer is no please state why
    yes

14. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes (b) No
    If your answer is no please state why
    yes

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

we pronounce the words Correctly.

Daily Classroom Activity Checklist

School code A Date 23/2/15 lesson 7 **Group 1**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes (b) No
   Comment on your answer please
   Yes, the classroom use is well ventilated and conducive for learning
2. Were the participants comfortably seated before learning commenced?
   (a) Yes (b) No
   If your answer is no please state why
   Yes
3. Were all the participants present in class?
   (a) Yes (b) No
   If your answer is no please state how many were absent
   Yes
4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   Yes
5. Did you brainstorm at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   Yes
6. Were all the materials needed for the session available?
   (a) Yes (b) No
   (Please tick the available ones)
   Audio player ✓
   Batteries ✓
   Flash drive ✓
   Flip charts ✓
   Plain sheets ✓
   Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes (b) No
   If your answer is no please comment
   Yes
8. Was there disruption by any student?
   (a) Yes (b) No
   If your answer is yes please comment on the kind of disruption
   No
9. Was there collaborative learning (group work) among the students?
   (a) Yes (b) No
   If your answer is no please state why
   Yes
10. Was there group presentation after the collaborative learning?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes (b) No
    If your answer is no please state why
    Yes
12. Did you ask the students questions during the lesson
    (a) Yes (b) No
    If your answer is no please state why
    Yes
13. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes (b) No ✓
14. Did you summarize the lesson at the end of the group presentation?
    (a) Yes (b) No

    If your answer is no please state why

yes

15. Did you comment or correct any errors made by the students in the collaborative learning activities?
(a) Yes ✓ (b) No
If your answer is no please state why
yes

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

vee practice the digraphs and how to pronounce the sound as in ch, ph, mp etc.

Daily Classroom Activity Checklist

School code A Date 23/2/15 lesson 9 **Group 2**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
(a) Yes (b) No
Comment on your answer please
yes, it was conducive

2. Were the participants comfortably seated before learning commenced?
(a) Yes (b) No
If your answer is no please state why
yes

3. Were all the participants present in class?
(a) Yes (b) No
If your answer is no please state how many were absent
No, one was absent

4. Were the learning objectives stated at the beginning of the lesson?
(a) Yes (b) No
If your answer is no please state why
yes

5. Did you brainstorm at the beginning of the lesson?
(a) Yes (b) No
If your answer is no please state why
yes

6. Were all the materials needed for the session available?
(a) Yes (b) No
(Please tick the available ones)
Audio player ✓
Batteries ✓
Flash drive ✓
Plain sheets ✓
Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes (b) No
   If your answer is no please comment
   yes

8. Was there disruption by any student?
   (a) Yes (b) No
   If your answer is yes please comment on the kind of disruption
   NO

9. Was there collaborative learning (group work) among the students?
   (a) Yes (b) No
   If your answer is no please state why
   yes

10. Was there group presentation after the collaborative learning?
    (a) Yes (b) No
    If your answer is no please state why
    yes

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes (b) No
    If your answer is no please state why
    yes

12. Was any written material seen in the class?

    (a) Yes (b) No
    If your answer is yes please state what kind of written material
    NO

13. Did you ask the students questions during the lesson
    (a) Yes (b) No
    If your answer is no please state why
    yes

14. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes (b) No

15. Did you summarize the lesson at the end of the group presentation?
    (a) Yes (b) No
    If your answer is no please state why
    yes

16. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes (b) No
    If your answer is no please state why
    yes

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

we practice how to pronounce the words with digraphs.

Daily Classroom Activity Checklist

School code A Date 23/2/15 lesson 7 **Group 3**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. Please try and be as honest as possible.

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes (b) No
   Comment on your answer please
   Yes, it was Conducive

2. Were the participants comfortably seated before learning commenced?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

3. Were all the participants present in class?
   (a) Yes (b) No
   If your answer is no please state how many were absent
   No, One was absent

4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

5. Did you brainstorm at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

6. Were all the materials needed for the session available?
   (a) Yes (b) No
   (Please tick the available ones)
   Lesson note ✓
   Chalk ✓
   Chalkboard duster ✓
   Plain sheets ✓
   Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

8. Was there disruption by any student?
   (a) Yes (b) No
   If your answer is yes please comment on the kind of disruption
   No

9. Was there collaborative learning (group work) among the students?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

10. Was there group presentation after the collaborative learning?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

Section C: Evaluation

11. Did you ask the students questions during the lesson
    (a) Yes (b) No
    If your answer is no please state why
    Yes

12. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes (b) No ✓

13. Did you summarize the lesson at the end of the group presentation?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

14. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

we Practice how to pronounce the words correctly

Daily Classroom Activity Checklist

School code A Date 25/2/15 lesson 8 **Group 1**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes (b) No
   Comment on your answer please
   Yes, the classroom was well ventilated and conducive for learning
2. Were the participants comfortably seated before learning commenced?
   (a) Yes (b) No
   If your answer is no please state why
   Yes
3. Were all the participants present in class?
   (a) Yes (b) No
   If your answer is no please state how many were absent
   Yes
4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   Yes
5. Did you brainstorm at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   Yes
6. Were all the materials needed for the session available?
   (a) Yes (b) No
   (Please tick the available ones)
   Audio player ✓
   Batteries ✓
   Flash drive ✓
   Flip charts ✓
   Plain sheets ✓
   Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes (b) No
   If your answer is no please comment
   Yes

8. Was there disruption by any student?
   (a) Yes (b) No
   If your answer is yes please comment on the kind of disruption
   No

9. Was there collaborative learning (group work) among the students?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

10. Was there group presentation after the collaborative learning?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

12. Did you ask the students questions during the lesson
    (a) Yes (b) No
    If your answer is no please state why
    Yes

13. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes (b) No

14. Did you summarize the lesson at the end of the group presentation?
    (a) Yes (b) No

    If your answer is no please state why
    Yes

15. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

We practice to pronounce the words with Consonant Cluster and digraph

Daily Classroom Activity Checklist

School code A Date 25/2/15 lesson 8 **Group 2**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes (b) No
   Comment on your answer please
   Yes, it was Conducive

2. Were the participants comfortably seated before learning commenced?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

3. Were all the participants present in class?
   (a) Yes (b) No
   If your answer is no please state how many were absent
   No, one was absent

4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

5. Did you brainstorm at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

6. Were all the materials needed for the session available?
   (a) Yes (b) No
   (Please tick the available ones)
   Audio player ✓
   Batteries ✓
   Flash drive ✓
   Plain sheets ✓
   Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes (b) No
   If your answer is no please comment
   Yes

8. Was there disruption by any student?
   (a) Yes (b) No
   If your answer is yes please comment on the kind of disruption
   No

9. Was there collaborative learning (group work) among the students?
   (a) Yes (b) No
   If your answer is no please state why
   Yes

10. Was there group presentation after the collaborative learning?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes (b) No
    If your answer is no please state why
    Yes

12. Was any written material seen in the class?
    (a) Yes (b) No
    If your answer is yes please state what kind of written material
    No

13. Did you ask the students questions during the lesson
    (a) Yes (b) No
    If your answer is no please state why
    Yes

14. Did the students have queries or needed clarification about any aspect of the lesson?
(a) Yes ✓ (b) No

15. Did you summarize the lesson at the end of the group presentation?
(a) Yes ✓ (b) No
If your answer is no please state why

16. Did you comment or correct any errors made by the students in the collaborative learning activities?
(a) Yes ✓ (b) No
If your answer is no please state why

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

Daily Classroom Activity Checklist

School code A Date 25/2/15 lesson 6 **Group 3**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. Please try and be as honest as possible.

Section A: Preparation

1. Was the environment conducive for learning?
(a) Yes (b) No
Comment on your answer please
Yes, it was Conducive

2. Were the participants comfortably seated before learning commenced?
(a) Yes (b) No
If your answer is no please state why
Yes

3. Were all the participants present in class?
(a) Yes (b) No
If your answer is no please state how many were absent
No, one was absent

4. Were the learning objectives stated at the beginning of the lesson?
(a) Yes (b) No
If your answer is no please state why
Yes

5. Did you brainstorm at the beginning of the lesson?
(a) Yes (b) No
If your answer is no please state why
Yes

6. Were all the materials needed for the session available?
(a) Yes (b) No
(Please tick the available ones)
Lesson note ✓
Chalk ✓
Chalkboard duster ✓
Plain sheets ✓
Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   yes

8. Was there disruption by any student?
   (a) Yes (b) No
   If your answer is yes please comment on the kind of disruption
   NO

9. Was there collaborative learning (group work) among the students?
   (a) Yes (b) No
   If your answer is no please state why
   yes

10. Was there group presentation after the collaborative learning?
    (a) Yes (b) No
    If your answer is no please state why
    yes

Section C: Evaluation

11. Did you ask the students questions during the lesson
    (a) Yes (b) No
    If your answer is no please state why
    yes

12. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes (b) No✓

13. Did you summarize the lesson at the end of the group presentation?
    (a) Yes (b) No
    If your answer is no please state why
    yes

14. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes (b) No
    If your answer is no please state why
    yes

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

we practice to pronounce the words learnt

Daily Classroom Activity Checklist

School code 16 Date 03/02/2015 lesson 1 **Group 1**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes (b) No
   Comment on your answer please
   It was indeed conducive

2. Were the participants comfortably seated before learning commenced?
   (a) Yes (b) No
   If your answer is no please state why

3. Were all the participants present in class?
   (a) Yes (b) No
   If your answer is no please state how many were absent
   One of the participant was sick

4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why
   \

5. Did you brainstorm at the beginning of the lesson?
   (a) Yes (b) No
   If your answer is no please state why

6. Were all the materials needed for the session available?
   (a) Yes (b) No
   (Please tick the available ones)
   Audio player
   Batteries
   Flash drive
   Flip charts
   Plain sheets
   Pens

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes (b) No
   If your answer is no please comment

8. Was there disruption by any student?
   (a) Yes (b) No
   If your answer is yes please comment on the kind of disruption

9. Was there collaborative learning (group work) among the students?
   (a) Yes (b) No
   If your answer is no please state why

10. Was there group presentation after the collaborative learning?
    (a) Yes (b) No
    If your answer is no please state why

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes (b) No
    If your answer is no please state why

12. Did you ask the students questions during the lesson
    (a) Yes (b) No
    If your answer is no please state why

13. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes (b) No

14. Did you summarize the lesson at the end of the group presentation?
    (a) Yes (b) No

    If your answer is no please state why

15. Did you comment or correct any errors made by the students in the collaborative learning activities?
(a) Yes ✓ (b) No
If your answer is no please state why

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

I tried giving the home work to heal them learn more about the lesson. I often ask them to identify con-sonant clusters on their own by providing them from the words they are familiar with.

Daily Classroom Activity Checklist

School code B Date 03/02/2015 lesson 1 **Group 2**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
(a) Yes (b) No
Comment on your answer please
It was actively conducive

2. Were the participants comfortably seated before learning commenced?
(a) Yes ✓ (b) No
If your answer is no please state why

3. Were all the participants present in class?
(a) Yes (b) No ✓
If your answer is no please state how many were absent
one was absent

4. Were the learning objectives stated at the beginning of the lesson?
(a) Yes ✓ (b) No
If your answer is no please state why

5. Did you brainstorm at the beginning of the lesson?
(a) Yes ✓ (b) No
If your answer is no please state why

6. Were all the materials needed for the session available?
(a) Yes ✓ (b) No
(Please tick the available ones)
Audio player ✓
Batteries ✓
Flash drive ✓
Plain sheets ✓
Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why

8. Was there disruption by any student?
   (a) Yes (b) No ✓
   If your answer is yes please comment on the kind of disruption

9. Was there collaborative learning (group work) among the students?
   (a) Yes ✓ (b) No
   If your answer is no please state why

10. Was there group presentation after the collaborative learning?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section C: Evaluation

11. Did you ask the students questions during the lesson
    (a) Yes ✓ (b) No
    If your answer is no please state why

12. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes ✓ (b) No

13. Did you summarize the lesson at the end of the group presentation?
    (a) Yes ✓ (b) No
    If your answer is no please state why

14. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

I create fun boxes and provide examples of different consonant cluster for them so as to, and I asked them to respond to some home which will help them to learn it well.

Daily Classroom Activity Checklist

School code B Date 03/02/2015 lesson 1 **Group 3**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. Please try and be as honest as possible.

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes ✓ (b) No
   Comment on your answer please

2. Were the participants comfortably seated before learning commenced?
   (a) Yes ✓ (b) No
   If your answer is no please state why

3. Were all the participants present in class?
   (a) Yes ✓ (b) No
   If your answer is no please state how many were absent

4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why

5. Did you brainstorm at the beginning of the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why

6. Were all the materials needed for the session available?
   (a) Yes ✓ (b) No
   (Please tick the available ones)
   Lesson note ✓
   Chalk ✓
   Chalkboard duster ✓
   Plain sheets ✓
   Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please comment

8. Was there disruption by any student?
   (a) Yes (b) No ✓
   If your answer is yes please comment on the kind of disruption

9. Was there collaborative learning (group work) among the students?
   (a) Yes ✓ (b) No
   If your answer is no please state why

10. Was there group presentation after the collaborative learning?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes ✓ (b) No
    If your answer is no please state why

12. Was any written material seen in the class?
    (a) Yes (b) No
    If your answer is yes please state what kind of written material
    Jen and paper

13. Did you ask the students questions during the lesson
    (a) Yes ✓ (b) No
    If your answer is no please state why

14. Did the students have queries or needed clarification about any aspect of the lesson?
(a) Yes ✓ (b) No

15. Did you summarize the lesson at the end of the group presentation?
(a) Yes ✓ (b) No
If your answer is no please state why

16. Did you comment or correct any errors made by the students in the collaborative learning activities?
(a) Yes ✓ (b) No
If your answer is no please state why

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

I tried to bring funy things and exam to relate the lesson wisely. Question were asked where students themselle were assigned to read and test my-self.

Daily Classroom Activity Checklist

School code D Date 05/02/2015 lesson 2 **Group 1**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
(a) Yes ✓ (b) No
Comment on your answer please

2. Were the participants comfortably seated before learning commenced?
(a) Yes ✓ (b) No
If your answer is no please state why

3. Were all the participants present in class?
(a) Yes ✓ (b) No
If your answer is no please state how many were absent

4. Were the learning objectives stated at the beginning of the lesson?
(a) Yes ✓ (b) No
If your answer is no please state why

5. Did you brainstorm at the beginning of the lesson?
(a) Yes ✓ (b) No
If your answer is no please state why

6. Were all the materials needed for the session available?
(a) Yes ✓ (b) No
(Please tick the available ones)
Audio player ✓
Batteries ✓
Flash drive ✓
Flip charts ✓
Plain sheets ✓
Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please comment

8. Was there disruption by any student?
   (a) Yes (b) No ✓
   If your answer is yes please comment on the kind of disruption

9. Was there collaborative learning (group work) among the students?
   (a) Yes ✓ (b) No
   If your answer is no please state why

10. Was there group presentation after the collaborative learning?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes ✓ (b) No
    If your answer is no please state why

12. Did you ask the students questions during the lesson
    (a) Yes ✓ (b) No
    If your answer is no please state why

13. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes ✓ (b) No

14. Did you summarize the lesson at the end of the group presentation?
    (a) Yes ✓ (b) No

    If your answer is no please state why

15. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

I gave them home work to be presented the next day which will help them master it well. Funy statement were made

Daily Classroom Activity Checklist

School code _____ Date 05/02/2015 lesson 2 **Group 2**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes ✓ (b) No
   Comment on your answer please
   _____
   _____

2. Were the participants comfortably seated before learning commenced?
   (a) Yes ✓ (b) No
   If your answer is no please state why
   _____
   _____

3. Were all the participants present in class?
   (a) Yes ✓ (b) No
   If your answer is no please state how many were absent
   _____
   _____

4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why
   _____
   _____

5. Did you brainstorm at the beginning of the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why
   _____
   _____

6. Were all the materials needed for the session available?
   (a) Yes (b) No
   (Please tick the available ones)
   Audio player ✓
   Batteries ✓
   Flash drive ✓
   Plain sheets ✓
   Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please comment
   _____
   _____

8. Was there disruption by any student?
   (a) Yes (b) No ✓
   If your answer is yes please comment on the kind of disruption
   _____
   _____

9. Was there collaborative learning (group work) among the students?
   (a) Yes ✓ (b) No
   If your answer is no please state why
   _____
   _____

10. Was there group presentation after the collaborative learning?
    (a) Yes ✓ (b) No
    If your answer is no please state why
    _____
    _____

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes ✓ (b) No
    If your answer is no please state why
    _____
    _____

12. Was any written material seen in the class?

    (a) Yes (b) No
    If your answer is yes please state what kind of written material
    Pens and Papers
    _____

13. Did you ask the students questions during the lesson
    (a) Yes ✓ (b) No
    If your answer is no please state why
    _____
    _____

14. Did the students have queries or needed clarification about any aspect of the lesson?
(a) Yes ✓ (b) No

15. Did you summarize the lesson at the end of the group presentation?
(a) Yes ✓ (b) No
If your answer is no please state why

16. Did you comment or correct any errors made by the students in the collaborative learning activities?
(a) Yes ✓ (b) No
If your answer is no please state why

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

Daily Classroom Activity Checklist

School code 3 Date 05/02/2015 lesson 2 **Group 3**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. Please try and be as honest as possible.

Section A: Preparation

1. Was the environment conducive for learning?
(a) Yes ✓ (b) No
Comment on your answer please

2. Were the participants comfortably seated before learning commenced?
(a) Yes ✓ (b) No
If your answer is no please state why

3. Were all the participants present in class?
(a) Yes ✓ (b) No
If your answer is no please state how many were absent

4. Were the learning objectives stated at the beginning of the lesson?
(a) Yes ✓ (b) No
If your answer is no please state why

5. Did you brainstorm at the beginning of the lesson?
(a) Yes ✓ (b) No
If your answer is no please state why

6. Were all the materials needed for the session available?
(a) Yes ✓ (b) No
(Please tick the available ones)
Lesson note ✓
Chalk ✓
Chalkboard duster ✓
Plain sheets ✓
Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why

8. Was there disruption by any student?
   (a) Yes (b) No ✓
   If your answer is yes please comment on the kind of disruption

9. Was there collaborative learning (group work) among the students?
   (a) Yes ✓ (b) No
   If your answer is no please state why

10. Was there group presentation after the collaborative learning?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section C: Evaluation

11. Did you ask the students questions during the lesson
    (a) Yes ✓ (b) No
    If your answer is no please state why

12. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes ✓ (b) No

13. Did you summarize the lesson at the end of the group presentation?
    (a) Yes ✓ (b) No
    If your answer is no please state why

14. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

Daily Classroom Activity Checklist

School code 13 Date 10/02/2015 lesson 3 **Group 1**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes ✓ (b) No
   Comment on your answer please
   The weather and the environment is conducive
2. Were the participants comfortably seated before learning commenced?
   (a) Yes ✓ (b) No
   If your answer is no please state why
3. Were all the participants present in class?
   (a) Yes ✓ (b) No
   If your answer is no please state how many were absent
4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why
5. Did you brainstorm at the beginning of the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why
6. Were all the materials needed for the session available?
   (a) Yes ✓ (b) No
   (Please tick the available ones)
   Audio player ✓
   Batteries ✓
   Flash drive ✓
   Flip charts ✓
   Plain sheets ✓
   Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please comment
8. Was there disruption by any student?
   (a) Yes (b) No ✓
   If your answer is yes please comment on the kind of disruption
9. Was there collaborative learning (group work) among the students?
   (a) Yes ✓ (b) No
   If your answer is no please state why
10. Was there group presentation after the collaborative learning?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes ✓ (b) No
    If your answer is no please state why
12. Did you ask the students questions during the lesson
    (a) Yes ✓ (b) No
    If your answer is no please state why
13. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes ✓ (b) No
14. Did you summarize the lesson at the end of the group presentation?
    (a) Yes ✓ (b) No

    If your answer is no please state why

15. Did you comment or correct any errors made by the students in the collaborative learning activities?
(a) Yes ✓ (b) No
If your answer is no please state why

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

I pronunced the words very well and realized the consonant clusters independently while the participants followed me.

Daily Classroom Activity Checklist

School code B Date 10/02/2015 lesson 3 **Group 2**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
(a) Yes ✓ (b) No
Comment on your answer please
Is always a favourable environment
2. Were the participants comfortably seated before learning commenced?
(a) Yes ✓ (b) No
If your answer is no please state why
3. Were all the participants present in class?
(a) Yes ✓ (b) No
If your answer is no please state how many were absent
4. Were the learning objectives stated at the beginning of the lesson?
(a) Yes ✓ (b) No
If your answer is no please state why
5. Did you brainstorm at the beginning of the lesson?
(a) Yes ✓ (b) No
If your answer is no please state why
6. Were all the materials needed for the session available?
(a) Yes (b) No
(Please tick the available ones)
Audio player ✓
Batteries ✓
Flash drive ✓
Plain sheets
Pens

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please comment

8. Was there disruption by any student?
   (a) Yes (b) No
   If your answer is yes please comment on the kind of disruption

9. Was there collaborative learning (group work) among the students?
   (a) Yes ✓ (b) No
   If your answer is no please state why

10. Was there group presentation after the collaborative learning?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes ✓ (b) No
    If your answer is no please state why

12. Was any written material seen in the class?
    (a) Yes (b) No ✓
    If your answer is yes please state what kind of written material

13. Did you ask the students questions during the lesson
    (a) Yes ✓ (b) No
    If your answer is no please state why

14. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes ✓ (b) No

15. Did you summarize the lesson at the end of the group presentation?
    (a) Yes ✓ (b) No
    If your answer is no please state why

16. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

Daily Classroom Activity Checklist

School code 15 Date 10/02/2015 lesson 3 **Group 3**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. Please try and be as honest as possible.

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes ✓ (b) No
   Comment on your answer please
   Is indeed spacious because of its ventilation

2. Were the participants comfortably seated before learning commenced?
   (a) Yes ✓ (b) No
   If your answer is no please state why

3. Were all the participants present in class?
   (a) Yes ✓ (b) No
   If your answer is no please state how many were absent

4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why

5. Did you brainstorm at the beginning of the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why

6. Were all the materials needed for the session available?
   (a) Yes ✓ (b) No
   (Please tick the available ones)
   Lesson note ✓
   Chalk ✓
   Chalkboard duster ✓
   Plain sheets ✓
   Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why

8. Was there disruption by any student?
   (a) Yes (b) No ✓
   If your answer is yes please comment on the kind of disruption

9. Was there collaborative learning (group work) among the students?
   (a) Yes ✓ (b) No
   If your answer is no please state why

10. Was there group presentation after the collaborative learning?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section C: Evaluation

11. Did you ask the students questions during the lesson
    (a) Yes ✓ (b) No
    If your answer is no please state why

12. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes ✓ (b) No

13. Did you summarize the lesson at the end of the group presentation?
    (a) Yes ✓ (b) No
    If your answer is no please state why

14. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

I repeatedly called out the words as the participants follow me.

Daily Classroom Activity Checklist

School code B Date 12/02/2015 lesson 4 **Group 1**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes ✓ (b) No
   Comment on your answer please
   The atmosphere appeared favourable
2. Were the participants comfortably seated before learning commenced?
   (a) Yes ✓ (b) No
   If your answer is no please state why
3. Were all the participants present in class?
   (a) Yes ✓ (b) No
   If your answer is no please state how many were absent
4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why
5. Did you brainstorm at the beginning of the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why
6. Were all the materials needed for the session available?
   (a) Yes ✓ (b) No
   (Please tick the available ones)
   Audio player ✓
   Batteries ✓
   Flash drive ✓
   Flip charts ✓
   Plain sheets ✓
   Pens —

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please comment
8. Was there disruption by any student?
   (a) Yes ✓ (b) No
   If your answer is yes please comment on the kind of disruption
9. Was there collaborative learning (group work) among the students?
   (a) Yes ✓ (b) No
   If your answer is no please state why
10. Was there group presentation after the collaborative learning?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes ✓ (b) No
    If your answer is no please state why
12. Did you ask the students questions during the lesson
    (a) Yes ✓ (b) No
    If your answer is no please state why
13. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes ✓ (b) No
14. Did you summarize the lesson at the end of the group presentation?
    (a) Yes ✓ (b) No

    If your answer is no please state why

15. Did you comment or correct any errors made by the students in the collaborative learning activities?
(a) Yes ✓ (b) No
If your answer is no please state why

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

I stress the topic for them to fathom it well.

Daily Classroom Activity Checklist

School code B Date 12/02/2015 lesson 4 **Group 2**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
(a) Yes ✓ (b) No
Comment on your answer please

2. Were the participants comfortably seated before learning commenced?
(a) Yes ✓ (b) No
If your answer is no please state why

3. Were all the participants present in class?
(a) Yes ✓ (b) No
If your answer is no please state how many were absent

4. Were the learning objectives stated at the beginning of the lesson?
(a) Yes ✓ (b) No
If your answer is no please state why

5. Did you brainstorm at the beginning of the lesson?
(a) Yes ✓ (b) No
If your answer is no please state why

6. Were all the materials needed for the session available?
(a) Yes (b) No
(Please tick the available ones)
Audio player ✓
Batteries ✓
Flash drive ✓
Plain sheets ✓
Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please comment

8. Was there disruption by any student?
   (a) Yes (b) No ✓
   If your answer is yes please comment on the kind of disruption

9. Was there collaborative learning (group work) among the students?
   (a) Yes ✓ (b) No
   If your answer is no please state why

10. Was there group presentation after the collaborative learning?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes ✓ (b) No
    If your answer is no please state why

12. Was any written material seen in the class?
    (a) Yes (b) No ✓
    If your answer is yes please state what kind of written material

13. Did you ask the students questions during the lesson
    (a) Yes ✓ (b) No
    If your answer is no please state why

14. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes ✓ (b) No

15. Did you summarize the lesson at the end of the group presentation?
    (a) Yes ✓ (b) No
    If your answer is no please state why

16. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

I refined the topic often time for emphasis

Daily Classroom Activity Checklist

School code B Date 12/02/2015 lesson 4 **Group 3**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. Please try and be as honest as possible.

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes ✓ (b) No
   Comment on your answer please

2. Were the participants comfortably seated before learning commenced?
   (a) Yes ✓ (b) No
   If your answer is no please state why

3. Were all the participants present in class?
   (a) Yes ✓ (b) No
   If your answer is no please state how many were absent

4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why

5. Did you brainstorm at the beginning of the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why

6. Were all the materials needed for the session available?
   (a) Yes ✓ (b) No
   (Please tick the available ones)
   Lesson note ✓
   Chalk ✓
   Chalkboard duster ✓
   Plain sheets ✓
   Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why

8. Was there disruption by any student?
   (a) Yes (b) No ✓
   If your answer is yes please comment on the kind of disruption

9. Was there collaborative learning (group work) among the students?
   (a) Yes ✓ (b) No
   If your answer is no please state why

10. Was there group presentation after the collaborative learning?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section C: Evaluation

11. Did you ask the students questions during the lesson
    (a) Yes ✓ (b) No
    If your answer is no please state why

12. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes ✓ (b) No

13. Did you summarize the lesson at the end of the group presentation?
    (a) Yes ✓ (b) No
    If your answer is no please state why

14. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

I created a funny tokes to make the lesson interesting and taught them how to pronounce each consonant cluster after I said them, they now followed.

Daily Classroom Activity Checklist

School code B Date 17/02/2015 lesson 5 **Group 1**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes ✓ (b) No
   Comment on your answer please

2. Were the participants comfortably seated before learning commenced?
   (a) Yes ✓ (b) No
   If your answer is no please state why

3. Were all the participants present in class?
   (a) Yes ✓ (b) No
   If your answer is no please state how many were absent

4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why

5. Did you brainstorm at the beginning of the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why

6. Were all the materials needed for the session available?
   (a) Yes (b) No
   (Please tick the available ones)
   Audio player ✓
   Batteries ✓
   Flash drive ✓
   Flip charts ✓
   Plain sheets ✓
   Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please comment

8. Was there disruption by any student?
   (a) Yes ✓ (b) No
   If your answer is yes please comment on the kind of disruption

9. Was there collaborative learning (group work) among the students?
   (a) Yes ✓ (b) No
   If your answer is no please state why

10. Was there group presentation after the collaborative learning?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes ✓ (b) No
    If your answer is no please state why

12. Did you ask the students questions during the lesson
    (a) Yes ✓ (b) No
    If your answer is no please state why

13. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes ✓ (b) No

14. Did you summarize the lesson at the end of the group presentation?
    (a) Yes ✓ (b) No

    If your answer is no please state why

15. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

I provide many examples outside the one in class with the students so that they will. Teachers will. A students asked about the necessity of a silent letters in spelling since they are not pronounced. I stressed to him that is because of the originality of English Language. Being a borrowed Language, it also need to be peculiar in its spelling. And due to the history of the words be it Latin or Greek.

Daily Classroom Activity Checklist

School code 13 Date 17/02/2015 lesson 5 **Group 2**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes ✓ (b) No
   Comment on your answer please
   _____
   _____

2. Were the participants comfortably seated before learning commenced?
   (a) Yes ✓ (b) No
   If your answer is no please state why
   _____
   _____

3. Were all the participants present in class?
   (a) Yes ✓ (b) No
   If your answer is no please state how many were absent
   _____
   _____

4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why
   _____
   _____

5. Did you brainstorm at the beginning of the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why
   _____
   _____

6. Were all the materials needed for the session available?
   (a) Yes (b) No
   (Please tick the available ones)
   Audio player ✓
   Batteries ✓
   Flash drive ✓
   Plain sheets ✓
   Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please comment
   _____
   _____

8. Was there disruption by any student?
   (a) Yes ✓ (b) No
   If your answer is yes please comment on the kind of disruption
   _____
   _____

9. Was there collaborative learning (group work) among the students?
   (a) Yes ✓ (b) No
   If your answer is no please state why
   _____
   _____

10. Was there group presentation after the collaborative learning?
    (a) Yes ✓ (b) No
    If your answer is no please state why
    _____
    _____

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes ✓ (b) No
    If your answer is no please state why
    _____
    _____

12. Was any written material seen in the class?
    (a) Yes (b) No ✓
    If your answer is yes please state what kind of written material
    _____
    _____

13. Did you ask the students questions during the lesson
    (a) Yes ✓ (b) No
    If your answer is no please state why
    _____
    _____

14. Did the students have queries or needed clarification about any aspect of the lesson?
(a) Yes ✓ (b) No

15. Did you summarize the lesson at the end of the group presentation?
(a) Yes (b) No
If your answer is no please state why

16. Did you comment or correct any errors made by the students in the collaborative learning activities?
(a) Yes ✓ (b) No
If your answer is no please state why

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

I created fun and short stories to help the lesson

Daily Classroom Activity Checklist

School code 5 Date 17/02/2015 lesson 5 **Group 3**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. Please try and be as honest as possible.

Section A: Preparation

1. Was the environment conducive for learning?
(a) Yes ✓ (b) No
Comment on your answer please

2. Were the participants comfortably seated before learning commenced?
(a) Yes ✓ (b) No
If your answer is no please state why

3. Were all the participants present in class?
(a) Yes ✓ (b) No
If your answer is no please state how many were absent

4. Were the learning objectives stated at the beginning of the lesson?
(a) Yes ✓ (b) No
If your answer is no please state why

5. Did you brainstorm at the beginning of the lesson?
(a) Yes ✓ (b) No
If your answer is no please state why

6. Were all the materials needed for the session available?
(a) Yes (b) No
(Please tick the available ones)
Lesson note ✓
Chalk ✓
Chalkboard duster ✓
Plain sheets ✓
Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why

8. Was there disruption by any student?
   (a) Yes ✓ (b) No
   If your answer is yes please comment on the kind of disruption

9. Was there collaborative learning (group work) among the students?
   (a) Yes ✓ (b) No
   If your answer is no please state why

10. Was there group presentation after the collaborative learning?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section C: Evaluation

11. Did you ask the students questions during the lesson
    (a) Yes ✓ (b) No
    If your answer is no please state why

12. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes ✓ (b) No

13. Did you summarize the lesson at the end of the group presentation?
    (a) Yes ✓ (b) No
    If your answer is no please state why

14. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

I repeated the lesson a/e-m for them to get it right.

Daily Classroom Activity Checklist

School code 13 Date 19/02/2015 lesson 6 **Group 1**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes ✓ (b) No
   Comment on your answer please
   _____
   _____

2. Were the participants comfortably seated before learning commenced?
   (a) Yes ✓ (b) No
   If your answer is no please state why
   _____
   _____

3. Were all the participants present in class?
   (a) Yes ✓ (b) No
   If your answer is no please state how many were absent
   _____
   _____

4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why
   _____
   _____

5. Did you brainstorm at the beginning of the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why
   _____
   _____

6. Were all the materials needed for the session available?
   (a) Yes (b) No
   (Please tick the available ones)
   Audio player ✓
   Batteries ✓
   Flash drive ✓
   Flip charts ✓
   Plain sheets ✓
   Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please comment
   _____
   _____

8. Was there disruption by any student?
   (a) Yes ✓ (b) No
   If your answer is yes please comment on the kind of disruption
   _____
   _____

9. Was there collaborative learning (group work) among the students?
   (a) Yes ✓ (b) No
   If your answer is no please state why
   _____
   _____

10. Was there group presentation after the collaborative learning?
    (a) Yes ✓ (b) No
    If your answer is no please state why
    _____
    _____

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes ✓ (b) No
    If your answer is no please state why
    _____
    _____

12. Did you ask the students questions during the lesson
    (a) Yes ✓ (b) No
    If your answer is no please state why
    _____
    _____

13. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes ✓ (b) No

14. Did you summarize the lesson at the end of the group presentation?
    (a) Yes ✓ (b) No

    If your answer is no please state why

15. Did you comment or correct any errors made by the students in the collaborative learning activities?
(a) Yes ✓ (b) No
If your answer is no please state why

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

I gave them examples even from their knowledge. Of consonant cluster and digraph.

Daily Classroom Activity Checklist

School code 6 Date 19/02/2015 lesson 8 **Group 2**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
(a) Yes ✓ (b) No
Comment on your answer please

2. Were the participants comfortably seated before learning commenced?
(a) Yes ✓ (b) No
If your answer is no please state why

3. Were all the participants present in class?
(a) Yes ✓ (b) No
If your answer is no please state how many were absent

4. Were the learning objectives stated at the beginning of the lesson?
(a) Yes ✓ (b) No
If your answer is no please state why

5. Did you brainstorm at the beginning of the lesson?
(a) Yes ✓ (b) No
If your answer is no please state why

6. Were all the materials needed for the session available?
(a) Yes ✓ (b) No
(Please tick the available ones)
Audio player ✓
Batteries ✓
Flash drive ✓
Plain sheets ✓
Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please comment

8. Was there disruption by any student?
   (a) Yes ✓ (b) No
   If your answer is yes please comment on the kind of disruption

9. Was there collaborative learning (group work) among the students?
   (a) Yes ✓ (b) No
   If your answer is no please state why

10. Was there group presentation after the collaborative learning?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes ✓ (b) No
    If your answer is no please state why

12. Was any written material seen in the class?
    (a) Yes ✓ (b) No
    If your answer is yes please state what kind of written material

13. Did you ask the students questions during the lesson
    (a) Yes ✓ (b) No
    If your answer is no please state why

14. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes ✓ (b) No

15. Did you summarize the lesson at the end of the group presentation?
    (a) Yes (b) No
    If your answer is no please state why

16. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

I gave practical examples which helped to get the lesson right

Daily Classroom Activity Checklist

School code B Date 19/02/2015 lesson 6 **Group 3**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. Please try and be as honest as possible.

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes ✓ (b) No
   Comment on your answer please

2. Were the participants comfortably seated before learning commenced?
   (a) Yes ✓ (b) No
   If your answer is no please state why

3. Were all the participants present in class?
   (a) Yes ✓ (b) No
   If your answer is no please state how many were absent

4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why

5. Did you brainstorm at the beginning of the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why

6. Were all the materials needed for the session available?
   (a) Yes (b) No
   (Please tick the available ones)
   Lesson note ✓
   Chalk ✓
   Chalkboard duster ✓
   Plain sheets ✓
   Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why

8. Was there disruption by any student?
   (a) Yes ✓ (b) No
   If your answer is yes please comment on the kind of disruption

9. Was there collaborative learning (group work) among the students?
   (a) Yes ✓ (b) No
   If your answer is no please state why

10. Was there group presentation after the collaborative learning?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section C: Evaluation

11. Did you ask the students questions during the lesson
    (a) Yes ✓ (b) No
    If your answer is no please state why

12. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes ✓ (b) No

13. Did you summarize the lesson at the end of the group presentation?
    (a) Yes ✓ (b) No
    If your answer is no please state why

14. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

Daily Classroom Activity Checklist

School code B Date 24/02/2015 lesson 7 **Group 1**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes ✓ (b) No
   Comment on your answer please

2. Were the participants comfortably seated before learning commenced?
   (a) Yes ✓ (b) No
   If your answer is no please state why

3. Were all the participants present in class?
   (a) Yes ✓ (b) No
   If your answer is no please state how many were absent

4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why

5. Did you brainstorm at the beginning of the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why

6. Were all the materials needed for the session available?
   (a) Yes ✓ (b) No
   (Please tick the available ones)
   Audio player ✓
   Batteries ✓
   Flash drive ✓
   Flip charts ✓
   Plain sheets ✓
   Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please comment

8. Was there disruption by any student?
   (a) Yes ✓ (b) No
   If your answer is yes please comment on the kind of disruption

9. Was there collaborative learning (group work) among the students?
   (a) Yes ✓ (b) No
   If your answer is no please state why

10. Was there group presentation after the collaborative learning?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes (b) No ✓
    If your answer is no please state why

12. Did you ask the students questions during the lesson
    (a) Yes ✓ (b) No
    If your answer is no please state why

13. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes ✓ (b) No

14. Did you summarize the lesson at the end of the group presentation?
    (a) Yes ✓ (b) No

    If your answer is no please state why

15. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

I often ask the question on previous lessons

Daily Classroom Activity Checklist

School code 15 Date 24/02/2015 lesson 7 **Group 2**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes ✓ (b) No
   Comment on your answer please
   _____
   _____

2. Were the participants comfortably seated before learning commenced?
   (a) Yes ✓ (b) No
   If your answer is no please state why
   _____
   _____

3. Were all the participants present in class?
   (a) Yes ✓ (b) No
   If your answer is no please state how many were absent
   _____
   _____

4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why
   _____
   _____

5. Did you brainstorm at the beginning of the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why
   _____
   _____

6. Were all the materials needed for the session available?
   (a) Yes ✓ (b) No
   (Please tick the available ones)
   Audio player ✓
   Batteries ✓
   Flash drive ✓
   Plain sheets ✓
   Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please comment
   _____
   _____

8. Was there disruption by any student?
   (a) Yes ✓ (b) No
   If your answer is yes please comment on the kind of disruption
   _____
   _____

9. Was there collaborative learning (group work) among the students?
   (a) Yes ✓ (b) No
   If your answer is no please state why
   _____
   _____

10. Was there group presentation after the collaborative learning?
    (a) Yes ✓ (b) No
    If your answer is no please state why
    _____
    _____

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes ✓ (b) No
    If your answer is no please state why
    _____
    _____

12. Was any written material seen in the class?
    (a) Yes ✓ (b) No
    If your answer is yes please state what kind of written material
    _____
    _____

13. Did you ask the students questions during the lesson
    (a) Yes ✓ (b) No
    If your answer is no please state why
    _____
    _____

14. Did the students have queries or needed clarification about any aspect of the lesson?
(a) Yes ✓ (b) No

15. Did you summarize the lesson at the end of the group presentation?
(a) Yes ✓ (b) No
If your answer is no please state why

16. Did you comment or correct any errors made by the students in the collaborative learning activities?
(a) Yes ✓ (b) No
If your answer is no please state why

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

More examples were given

Daily Classroom Activity Checklist

School code B Date 24/02/2015 lesson 7 **Group 3**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. Please try and be as honest as possible.

Section A: Preparation

1. Was the environment conducive for learning?
(a) Yes ✓ (b) No
Comment on your answer please

2. Were the participants comfortably seated before learning commenced?
(a) Yes ✓ (b) No
If your answer is no please state why

3. Were all the participants present in class?
(a) Yes ✓ (b) No
If your answer is no please state how many were absent

4. Were the learning objectives stated at the beginning of the lesson?
(a) Yes ✓ (b) No
If your answer is no please state why

5. Did you brainstorm at the beginning of the lesson?
(a) Yes ✓ (b) No
If your answer is no please state why

6. Were all the materials needed for the session available?
(a) Yes ✓ (b) No
(Please tick the available ones)
Lesson note ✓
Chalk ✓
Chalkboard duster ✓
Plain sheets ✓
Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why

8. Was there disruption by any student?
   (a) Yes ✓ (b) No
   If your answer is yes please comment on the kind of disruption

9. Was there collaborative learning (group work) among the students?
   (a) Yes ✓ (b) No
   If your answer is no please state why

10. Was there group presentation after the collaborative learning?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section C: Evaluation

11. Did you ask the students questions during the lesson
    (a) Yes ✓ (b) No
    If your answer is no please state why

12. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes ✓ (b) No

13. Did you summarize the lesson at the end of the group presentation?
    (a) Yes ✓ (b) No
    If your answer is no please state why

14. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

I tried in asking to tell me what they have learnt

Daily Classroom Activity Checklist

School code B Date 26/02/2015 lesson 6 **Group 1**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes ✓ (b) No
   Comment on your answer please
   The Place is favourable.

2. Were the participants comfortably seated before learning commenced?
   (a) Yes ✓ (b) No
   If your answer is no please state why

3. Were all the participants present in class?
   (a) Yes ✓ (b) No
   If your answer is no please state how many were absent

4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why

5. Did you brainstorm at the beginning of the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why

6. Were all the materials needed for the session available?
   (a) Yes ✓ (b) No
   (Please tick the available ones)
   Audio player ✓
   Batteries ✓
   Flash drive ✓
   Flip charts ✓
   Plain sheets ✓
   Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes (b) No
   If your answer is no please comment

8. Was there disruption by any student?
   (a) Yes ✓ (b) No
   If your answer is yes please comment on the kind of disruption

9. Was there collaborative learning (group work) among the students?
   (a) Yes ✓ (b) No
   If your answer is no please state why

10. Was there group presentation after the collaborative learning?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes ✓ (b) No
    If your answer is no please state why

12. Did you ask the students questions during the lesson
    (a) Yes ✓ (b) No
    If your answer is no please state why

13. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes ✓ (b) No

14. Did you summarize the lesson at the end of the group presentation?
    (a) Yes ✓ (b) No

    If your answer is no please state why

15. Did you comment or correct any errors made by the students in the collaborative learning activities?
(a) Yes ✓ (b) No
If your answer is no please state why

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

I provide enough examples of each topic for them to understand.

Daily Classroom Activity Checklist

School code B Date 26/02/2015 lesson 8 **Group 2**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. **(Please try and be as honest as possible)**

Section A: Preparation

1. Was the environment conducive for learning?
(a) Yes ✓ (b) No
Comment on your answer please

2. Were the participants comfortably seated before learning commenced?
(a) Yes ✓ (b) No
If your answer is no please state why

3. Were all the participants present in class?
(a) Yes ✓ (b) No
If your answer is no please state how many were absent

4. Were the learning objectives stated at the beginning of the lesson?
(a) Yes ✓ (b) No
If your answer is no please state why

5. Did you brainstorm at the beginning of the lesson?
(a) Yes ✓ (b) No
If your answer is no please state why

6. Were all the materials needed for the session available?
(a) Yes (b) No
(Please tick the available ones)
Audio player ✓
Batteries ✓
Flash drive ✓
Plain sheets ✓
Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please comment

8. Was there disruption by any student?
   (a) Yes ✓ (b) No
   If your answer is yes please comment on the kind of disruption

9. Was there collaborative learning (group work) among the students?
   (a) Yes ✓ (b) No
   If your answer is no please state why

10. Was there group presentation after the collaborative learning?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section C: Evaluation

11. Did you complete the material for the lesson?
    (a) Yes (b) No
    If your answer is no please state why

12. Was any written material seen in the class?
    (a) Yes (b) No ✓
    If your answer is yes please state what kind of written material

13. Did you ask the students questions during the lesson
    (a) Yes ✓ (b) No
    If your answer is no please state why

14. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes ✓ (b) No

15. Did you summarize the lesson at the end of the group presentation?
    (a) Yes ✓ (b) No
    If your answer is no please state why

16. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

We often go over the topic for proper understanding.

Daily Classroom Activity Checklist

School code B Date 26/02/2015 lesson 8 **Group 3**

Below is a list of activities that are expected to be accomplished at the end of each lesson. Tick the correct option and comment appropriately. Please try and be as honest as possible.

Section A: Preparation

1. Was the environment conducive for learning?
   (a) Yes ✓ (b) No
   Comment on your answer please

2. Were the participants comfortably seated before learning commenced?
   (a) Yes ✓ (b) No
   If your answer is no please state why

3. Were all the participants present in class?
   (a) Yes ✓ (b) No
   If your answer is no please state how many were absent

4. Were the learning objectives stated at the beginning of the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why

5. Did you brainstorm at the beginning of the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why

6. Were all the materials needed for the session available?
   (a) Yes (b) No
   (Please tick the available ones)
   Lesson note ✓
   Chalk ✓
   Chalkboard duster ✓
   Plain sheets ✓
   Pens ✓

Section B: Participation

7. Were the students attentive during the lesson?
   (a) Yes ✓ (b) No
   If your answer is no please state why

8. Was there disruption by any student?
   (a) Yes ✓ (b) No
   If your answer is yes please comment on the kind of disruption

9. Was there collaborative learning (group work) among the students?
   (a) Yes ✓ (b) No
   If your answer is no please state why

10. Was there group presentation after the collaborative learning?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section C: Evaluation

11. Did you ask the students questions during the lesson
    (a) Yes ✓ (b) No
    If your answer is no please state why

12. Did the students have queries or needed clarification about any aspect of the lesson?
    (a) Yes ✓ (b) No

13. Did you summarize the lesson at the end of the group presentation?
    (a) Yes ✓ (b) No
    If your answer is no please state why

14. Did you comment or correct any errors made by the students in the collaborative learning activities?
    (a) Yes ✓ (b) No
    If your answer is no please state why

Section D: Other comments

Comment on any good practice you did to improve the lesson and to achieve the lesson objectives.

funny jokes were used to make the whole lesson interesting.